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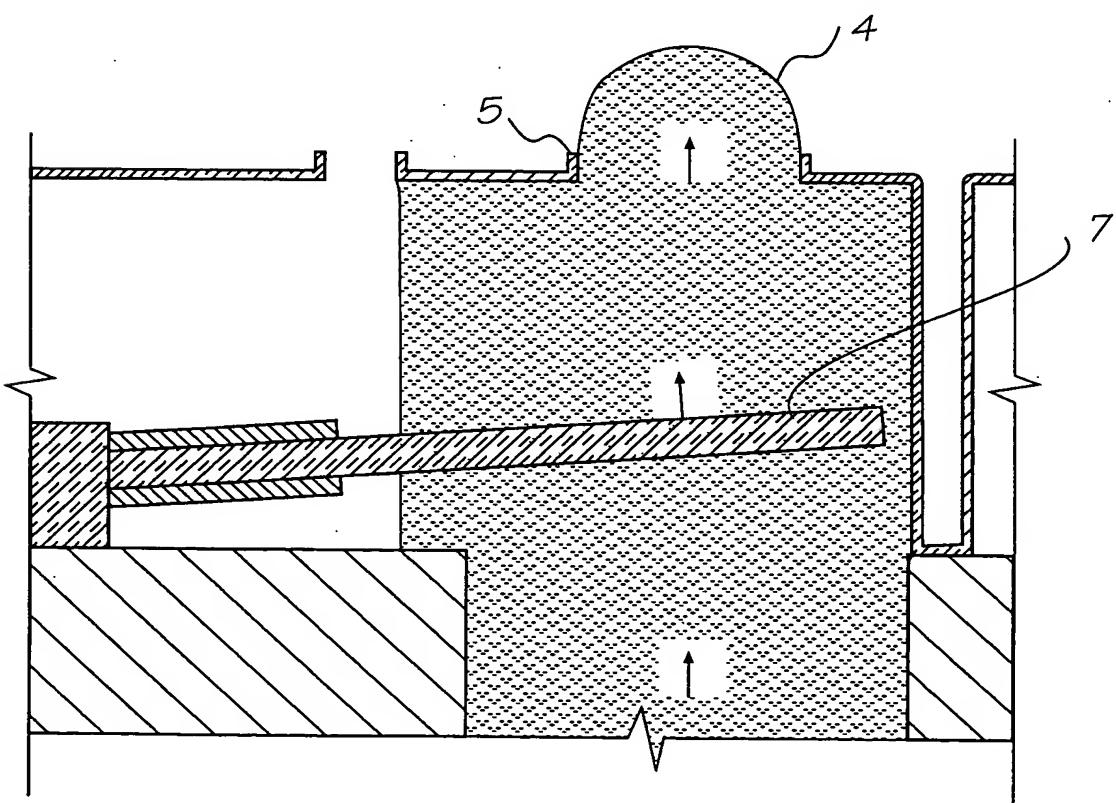
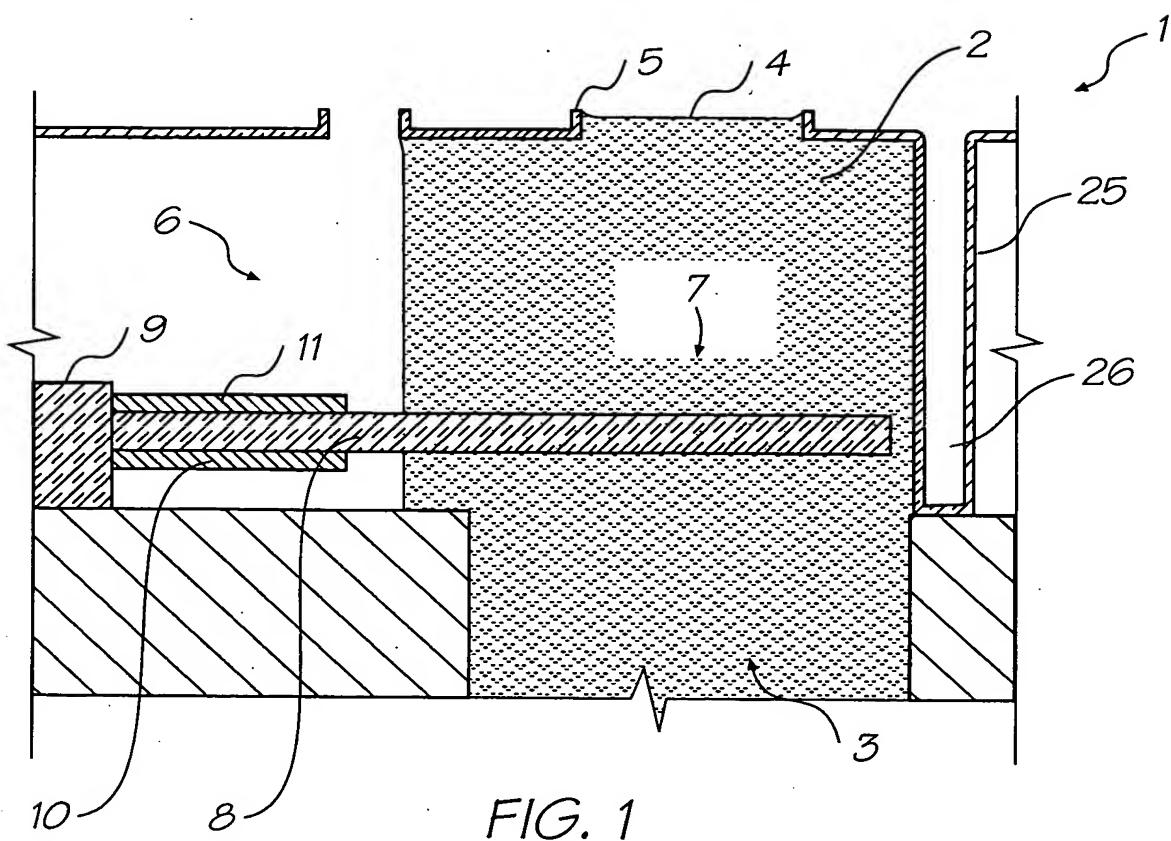


FIG. 2

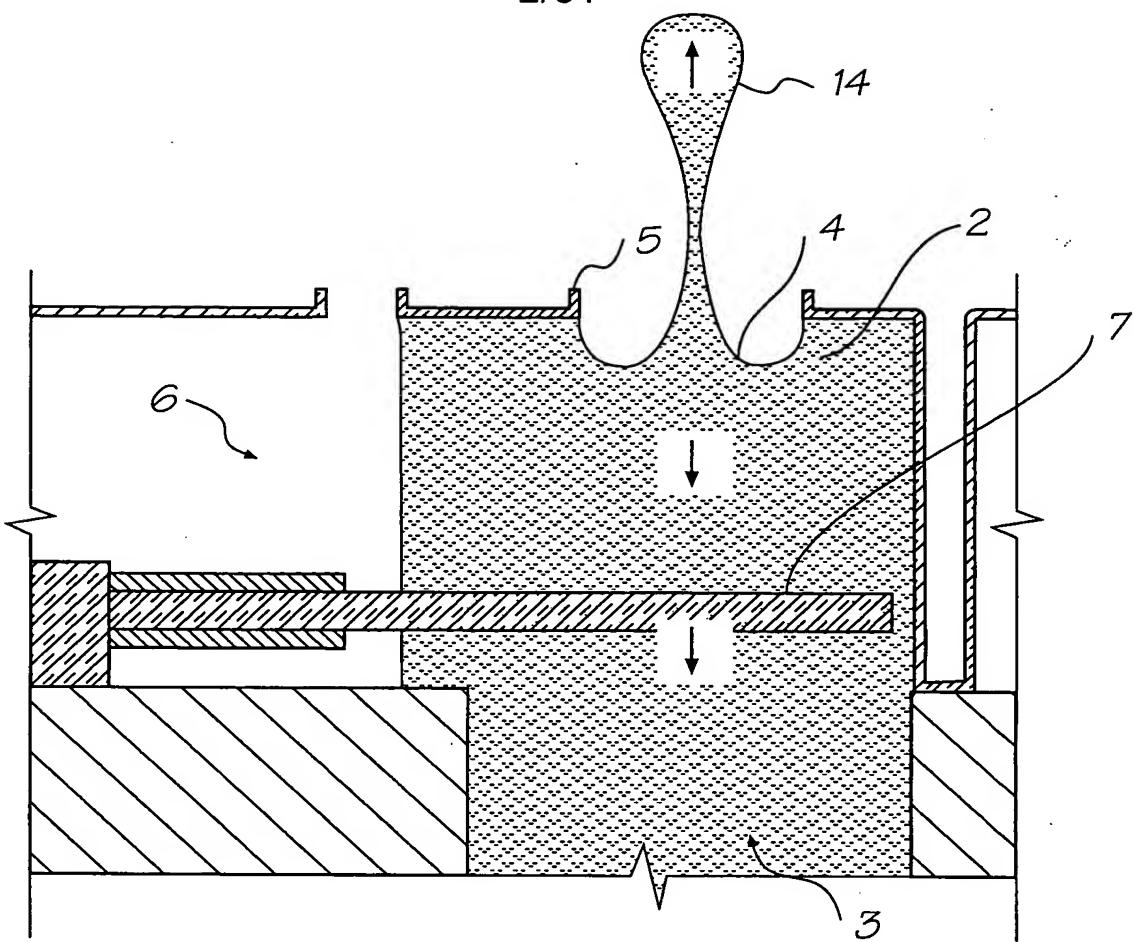


FIG. 3

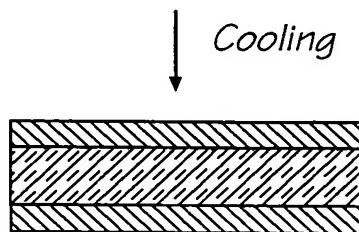
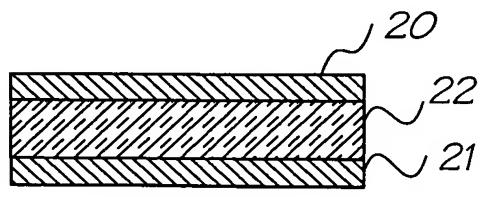


FIG. 4

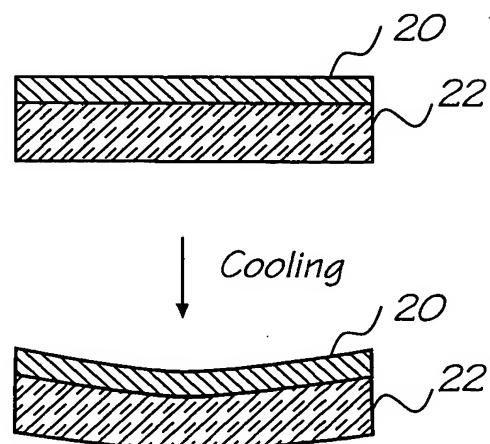


FIG. 5

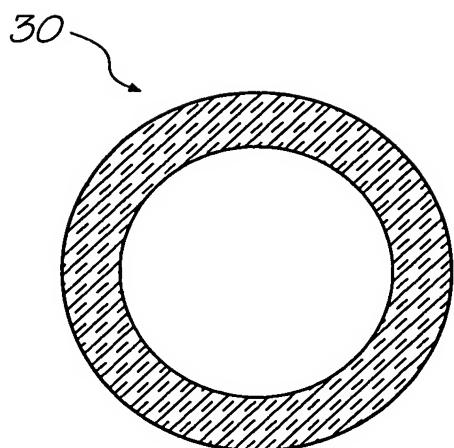


FIG. 6

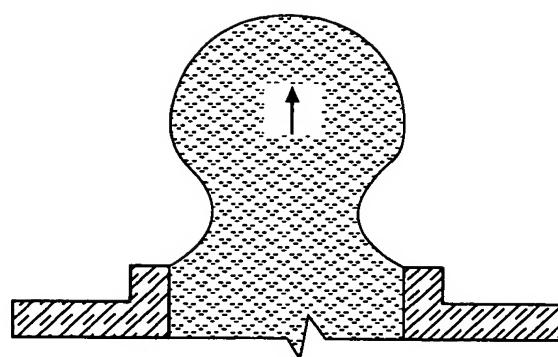


FIG. 7

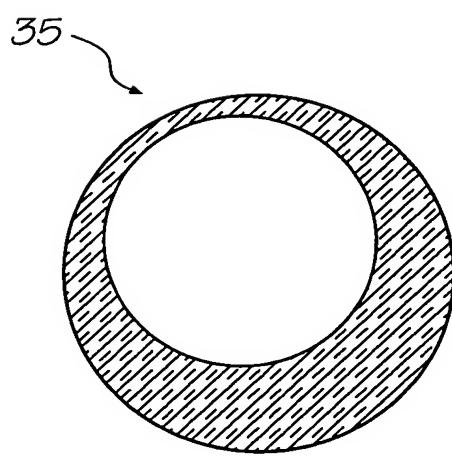


FIG. 8

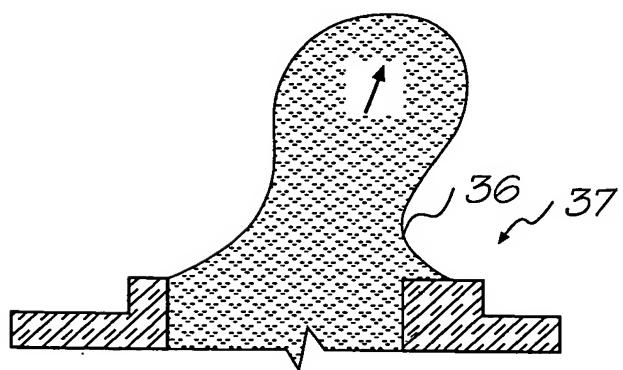


FIG. 9

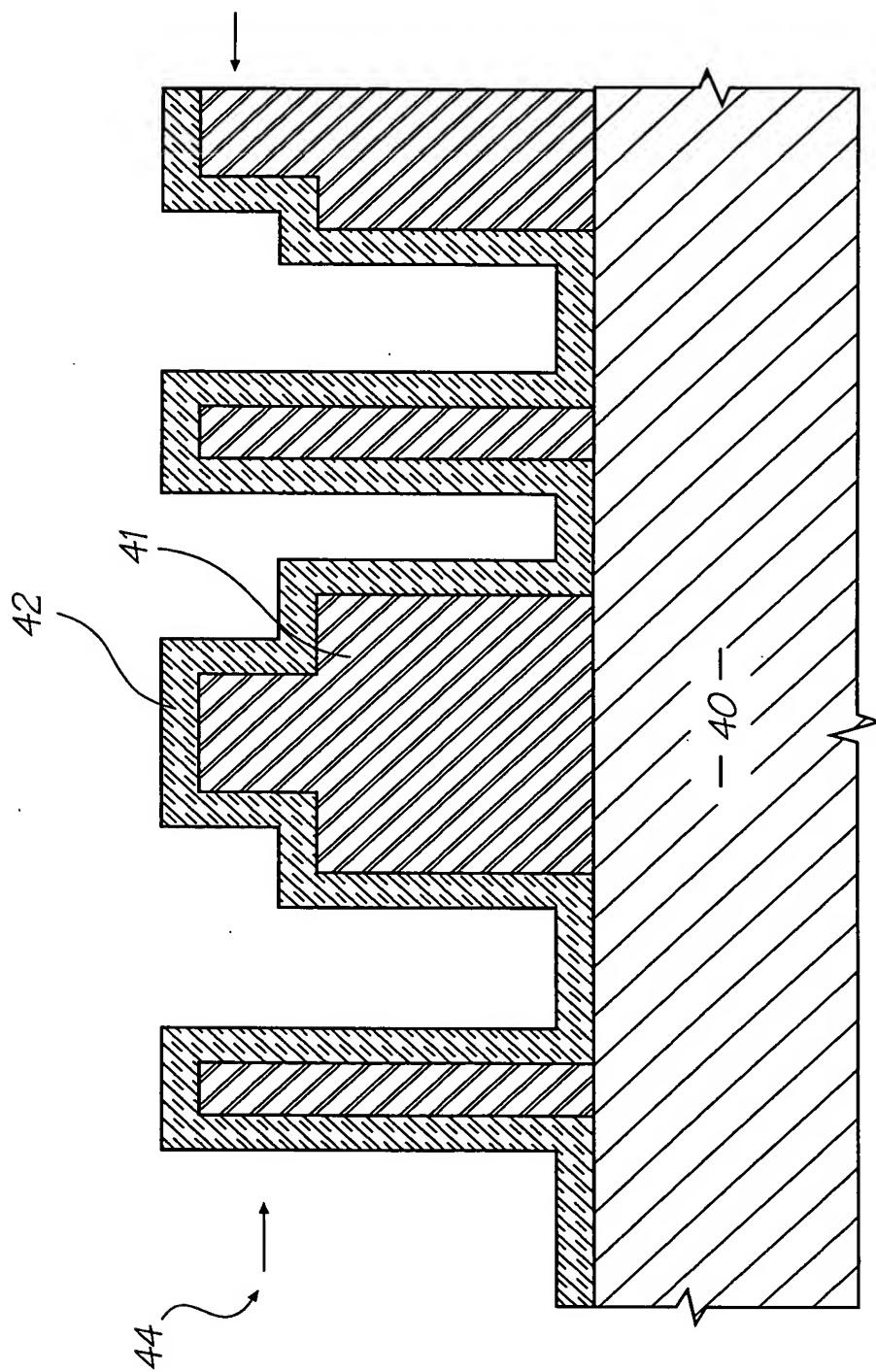


FIG. 10

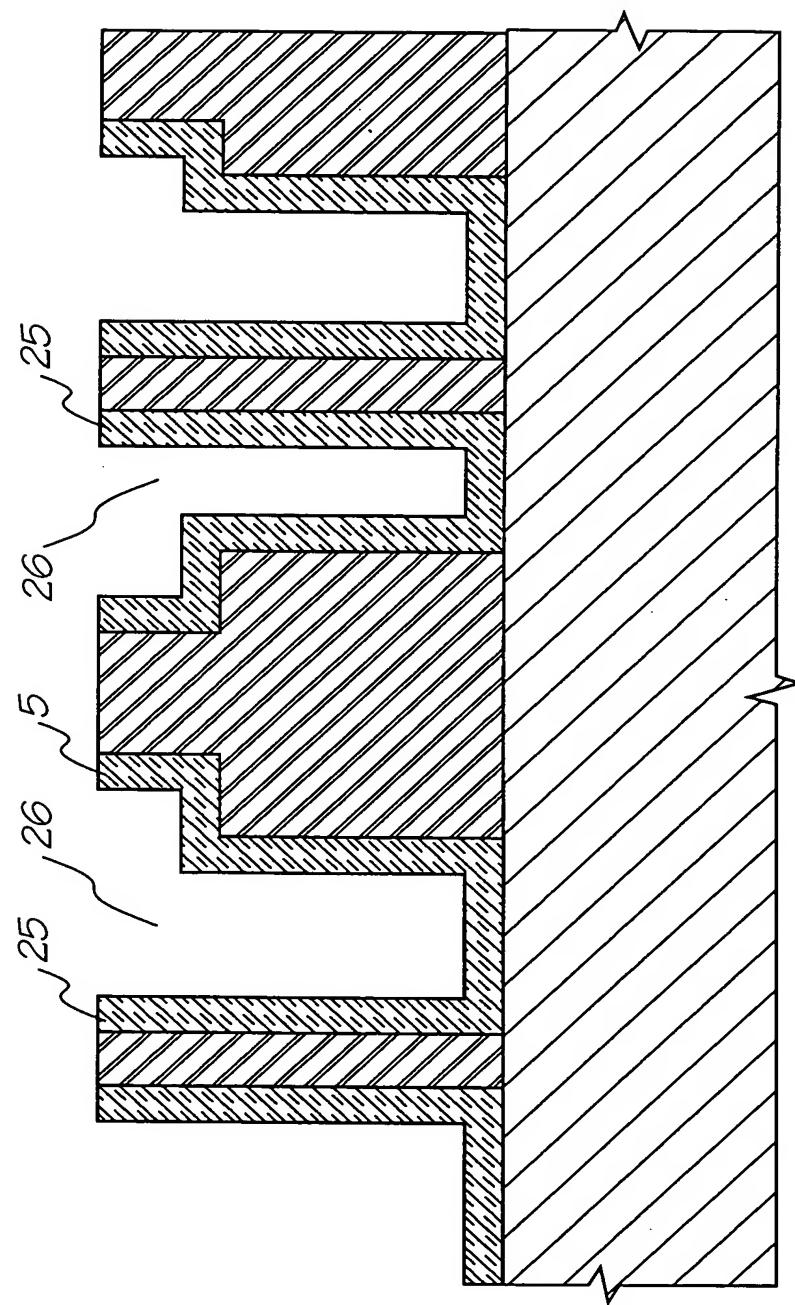


FIG. 11

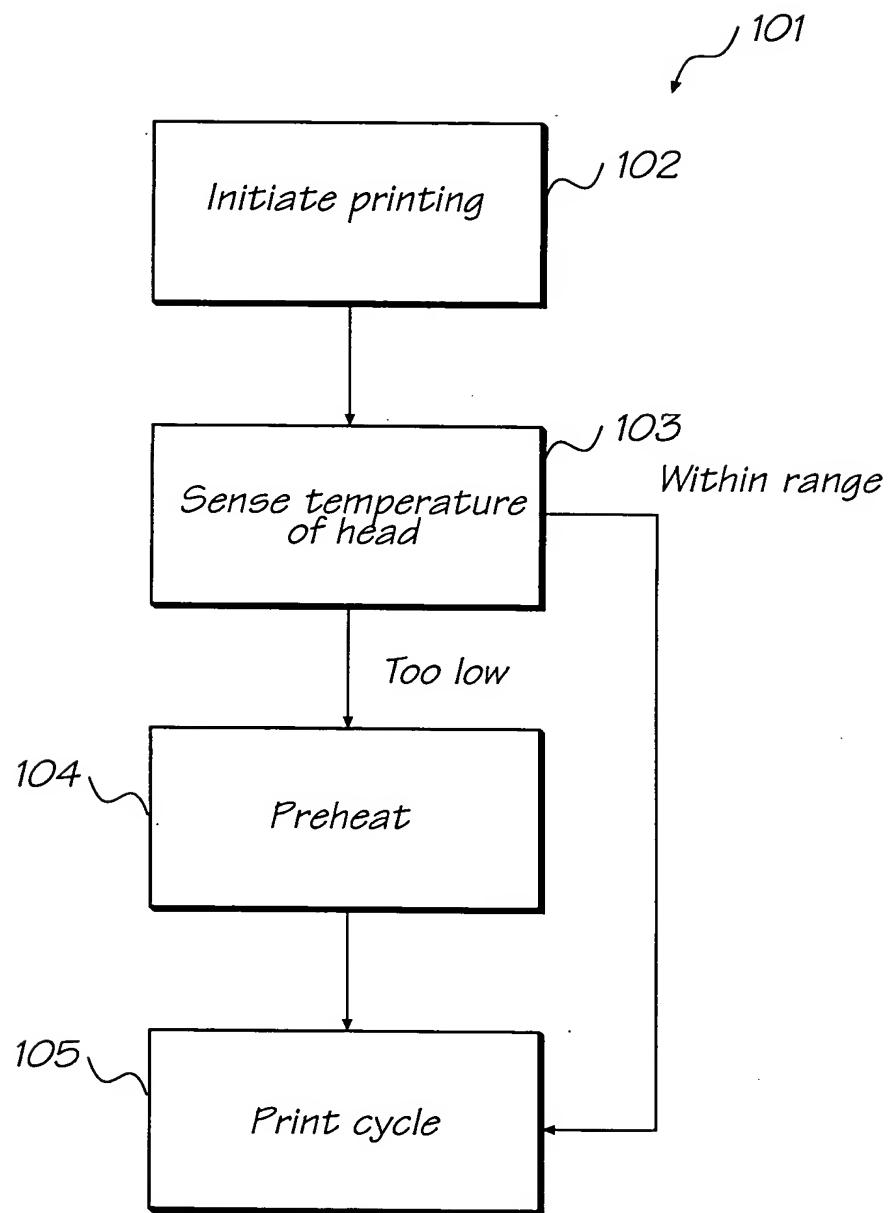


FIG. 12

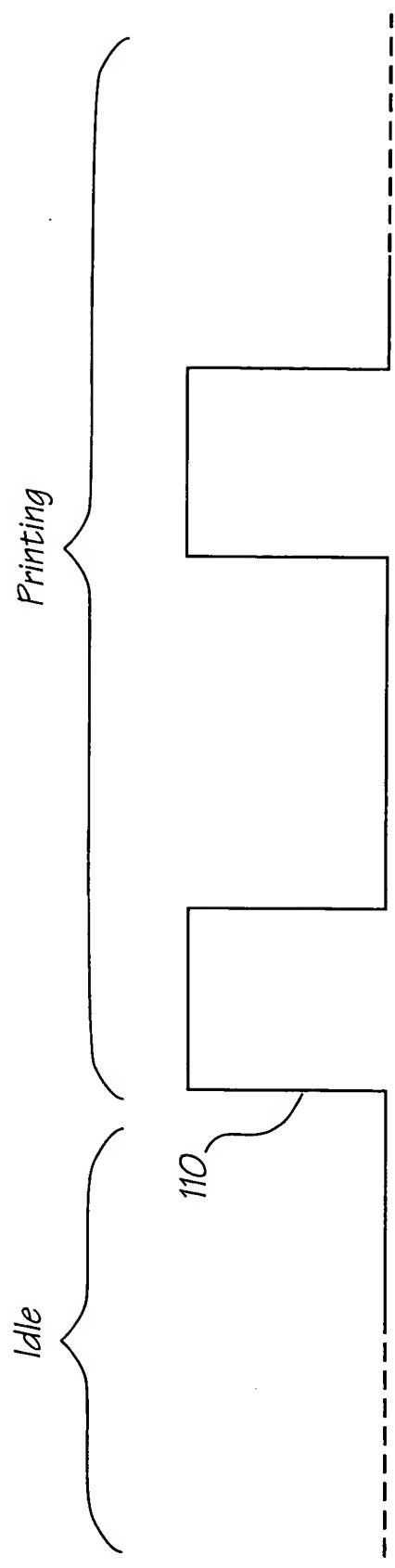


FIG. 13

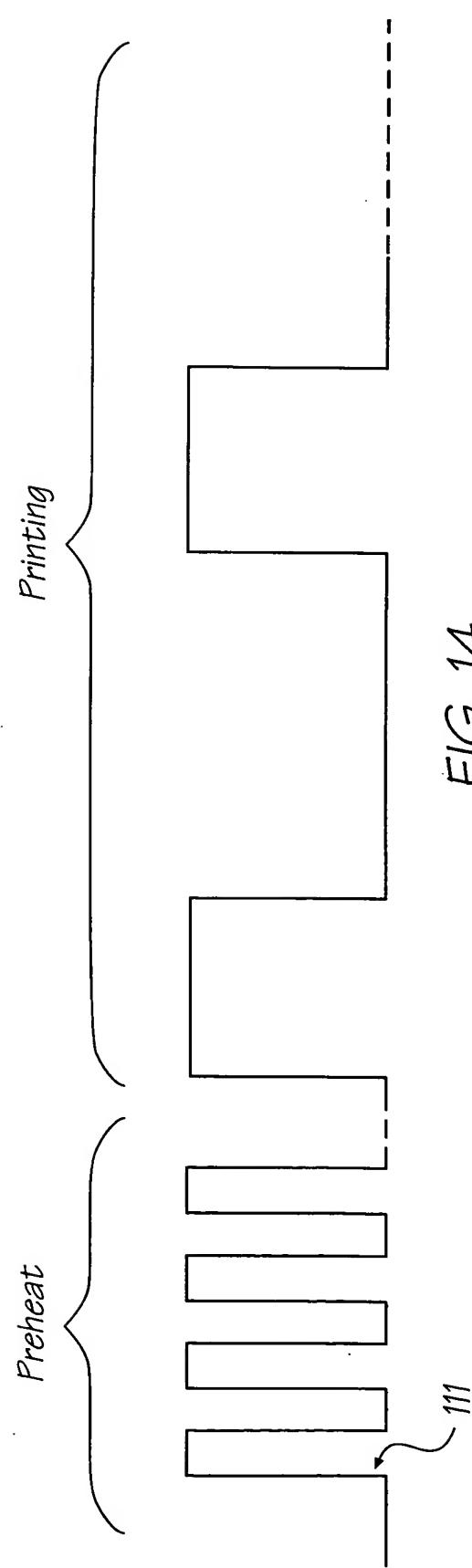


FIG. 14

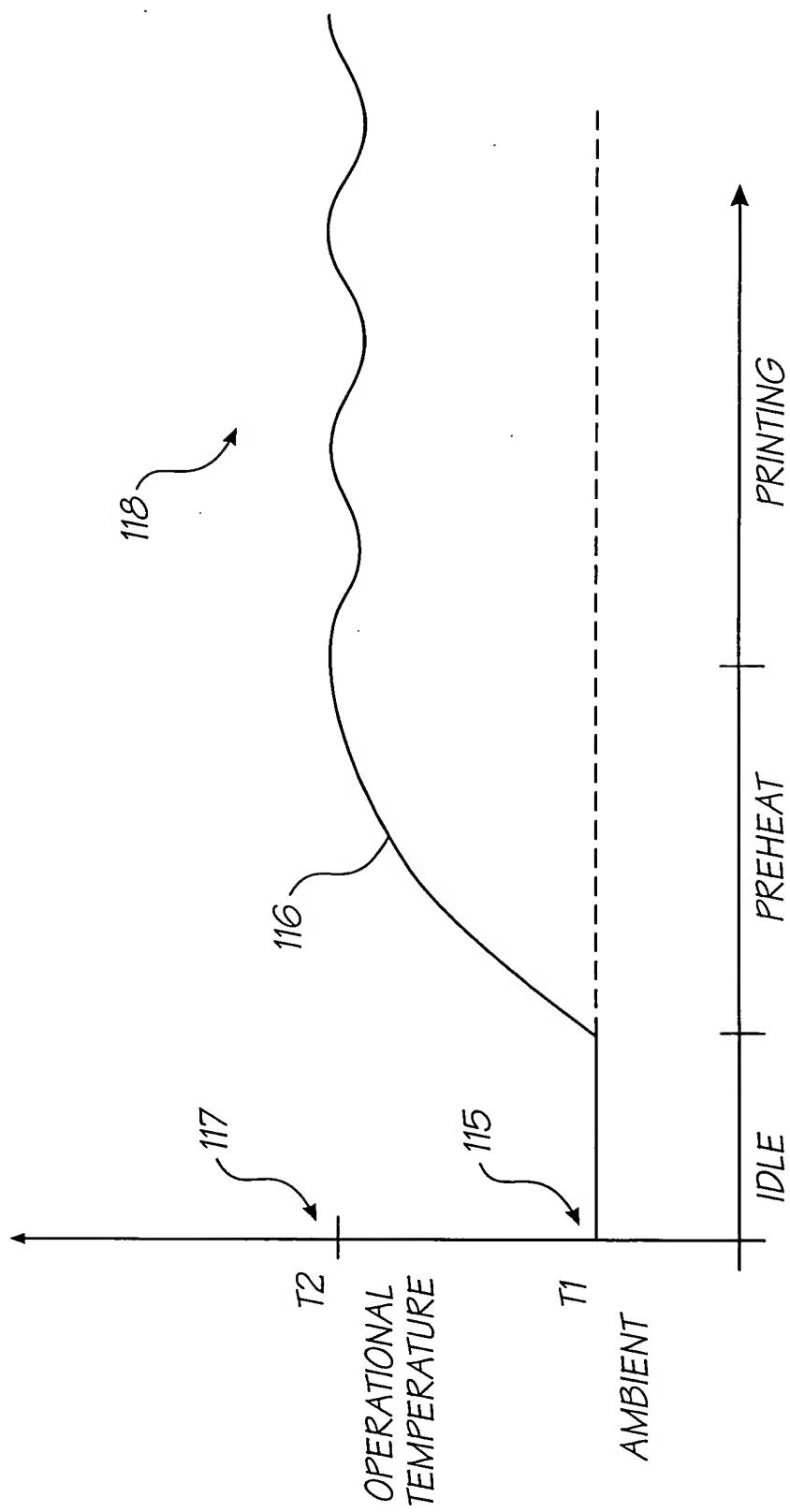


FIG. 15

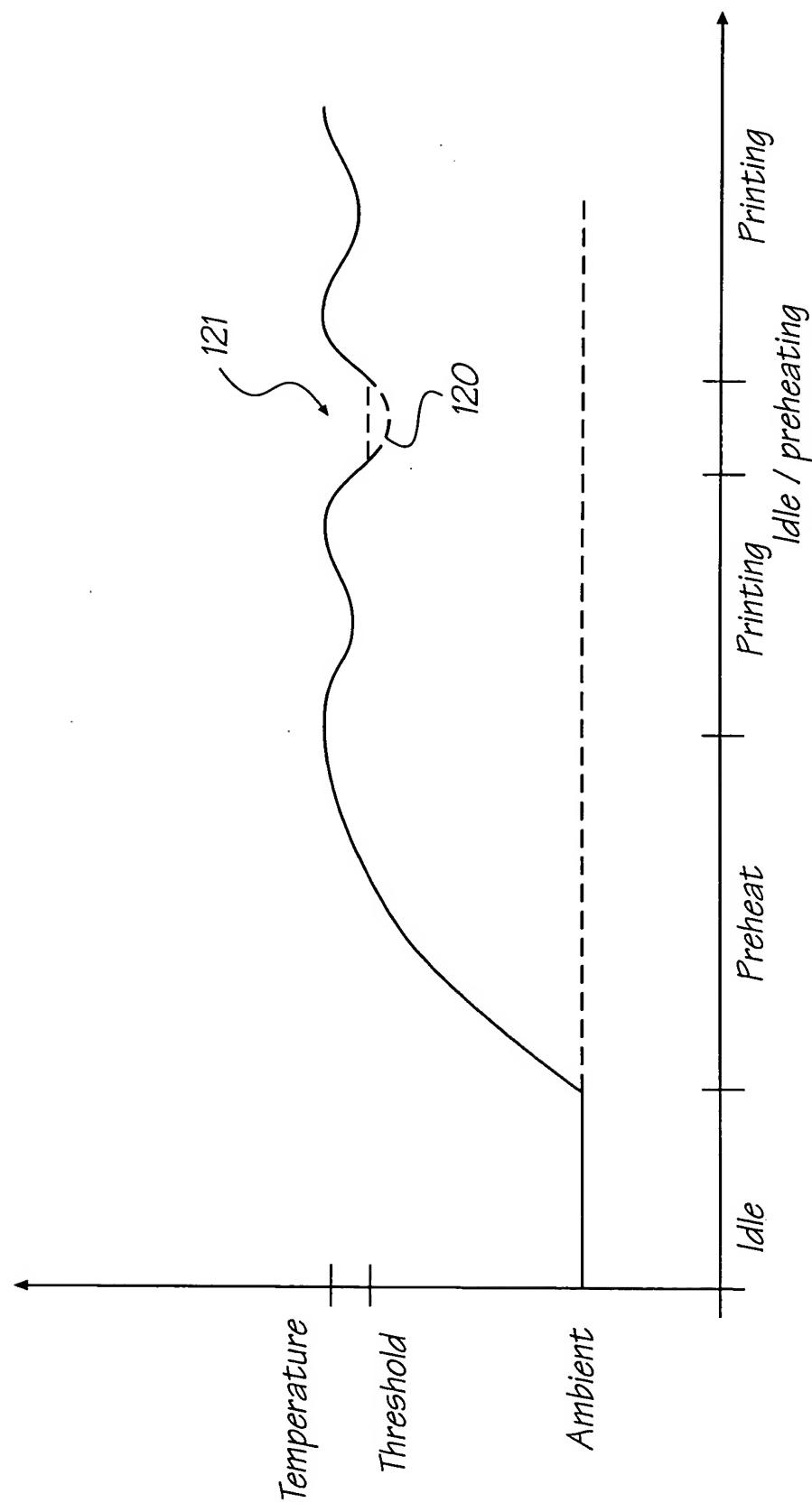


FIG. 16

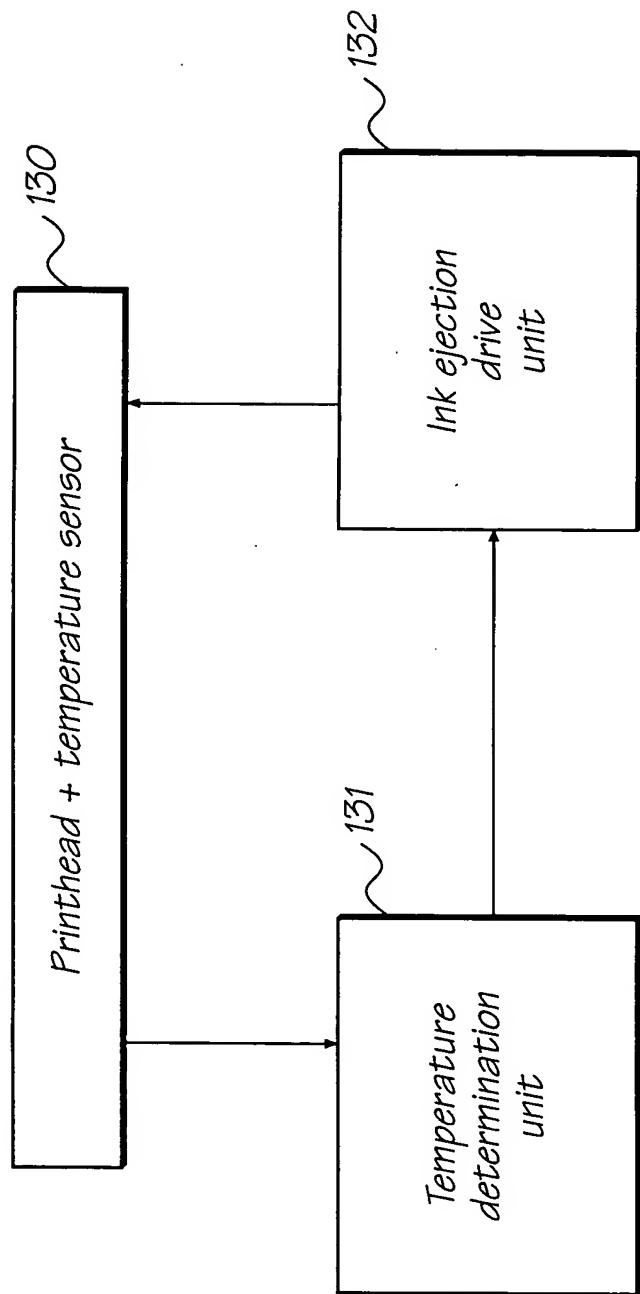


FIG. 17

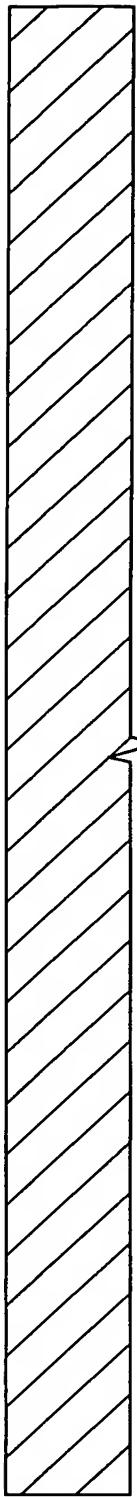
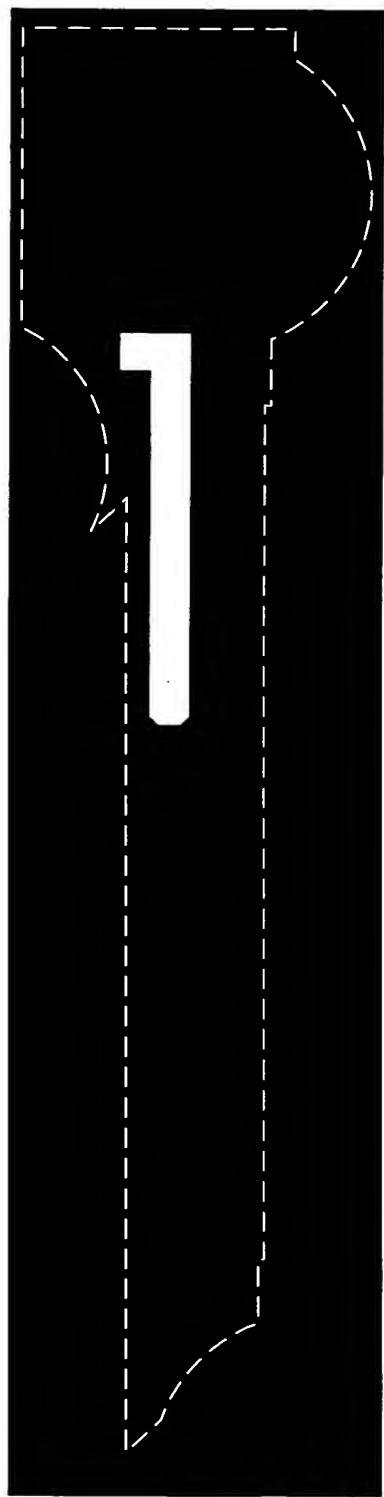
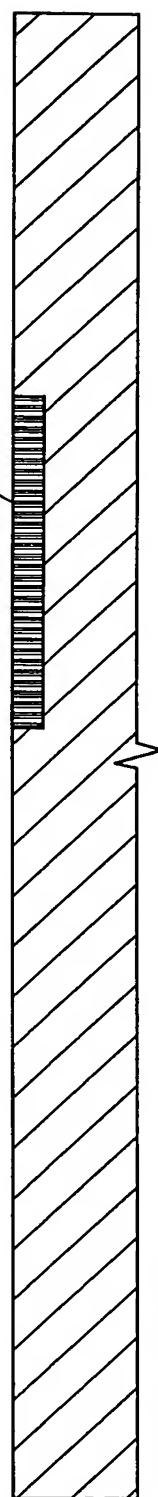


FIG. 18



N-Well mask

210



Implant N-Well

FIG. 20

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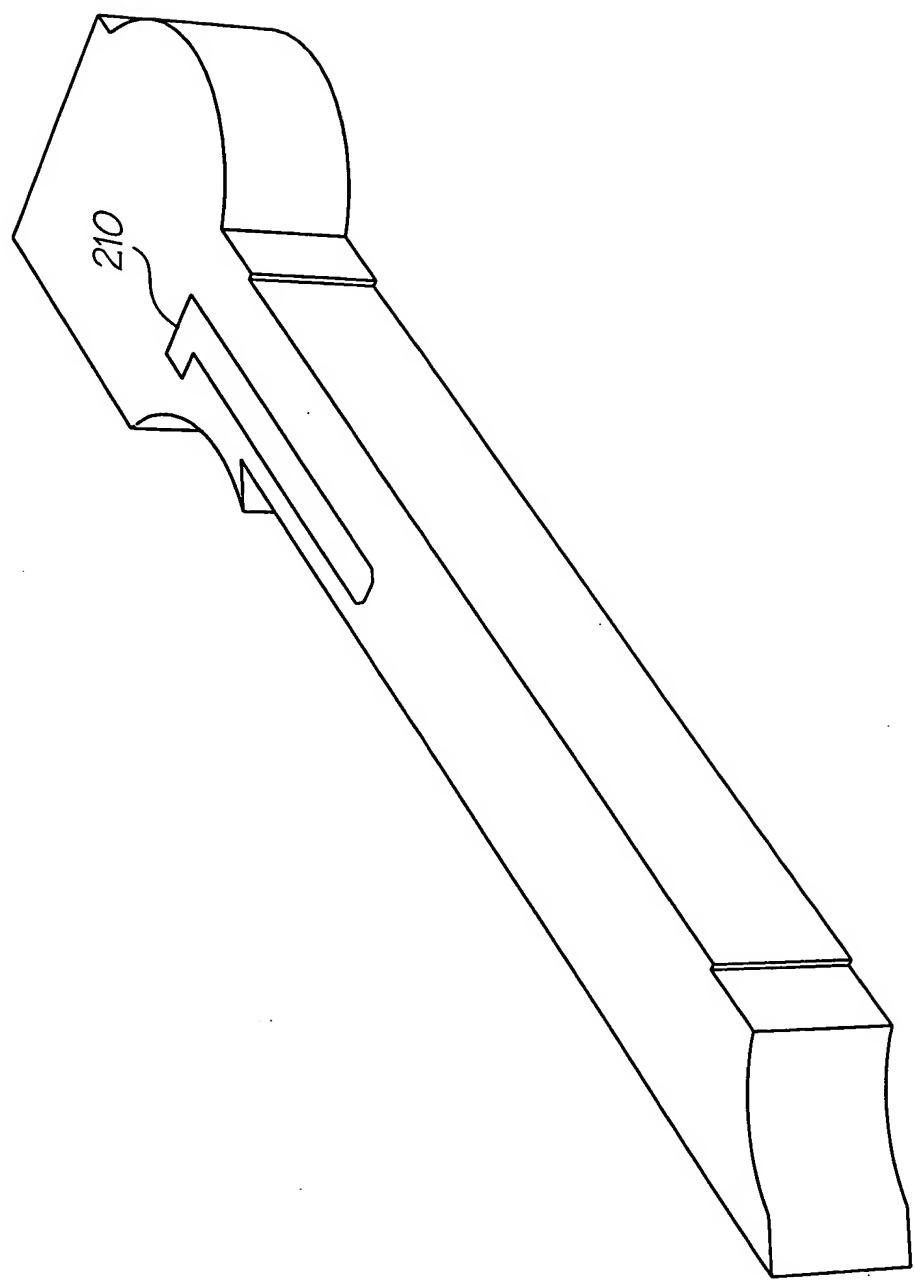
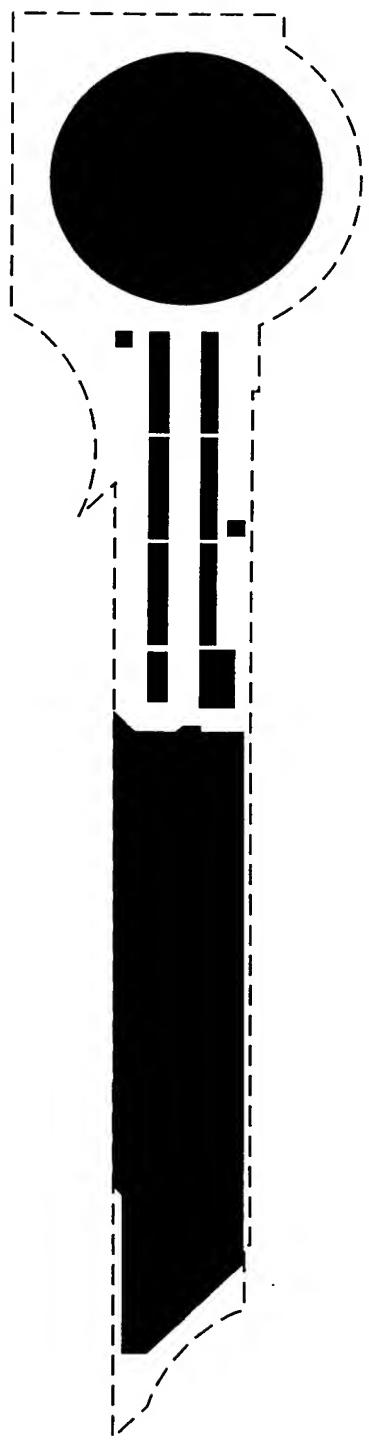
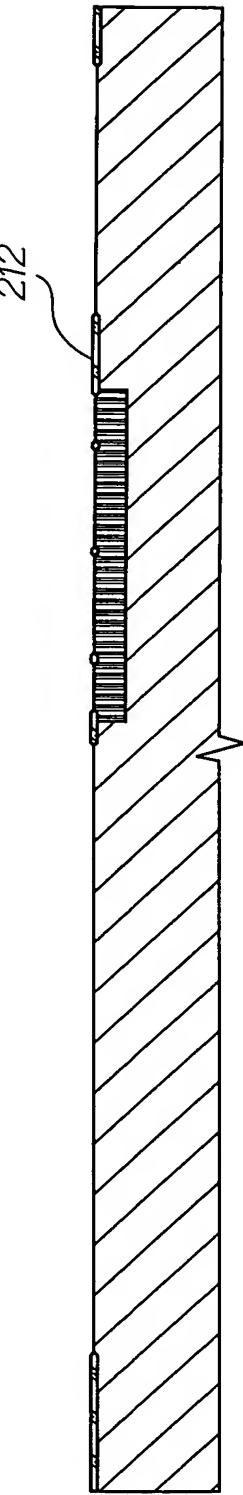


FIG. 21



*Active mask*

*FIG. 22*



*Grow field oxide*

*FIG. 23*

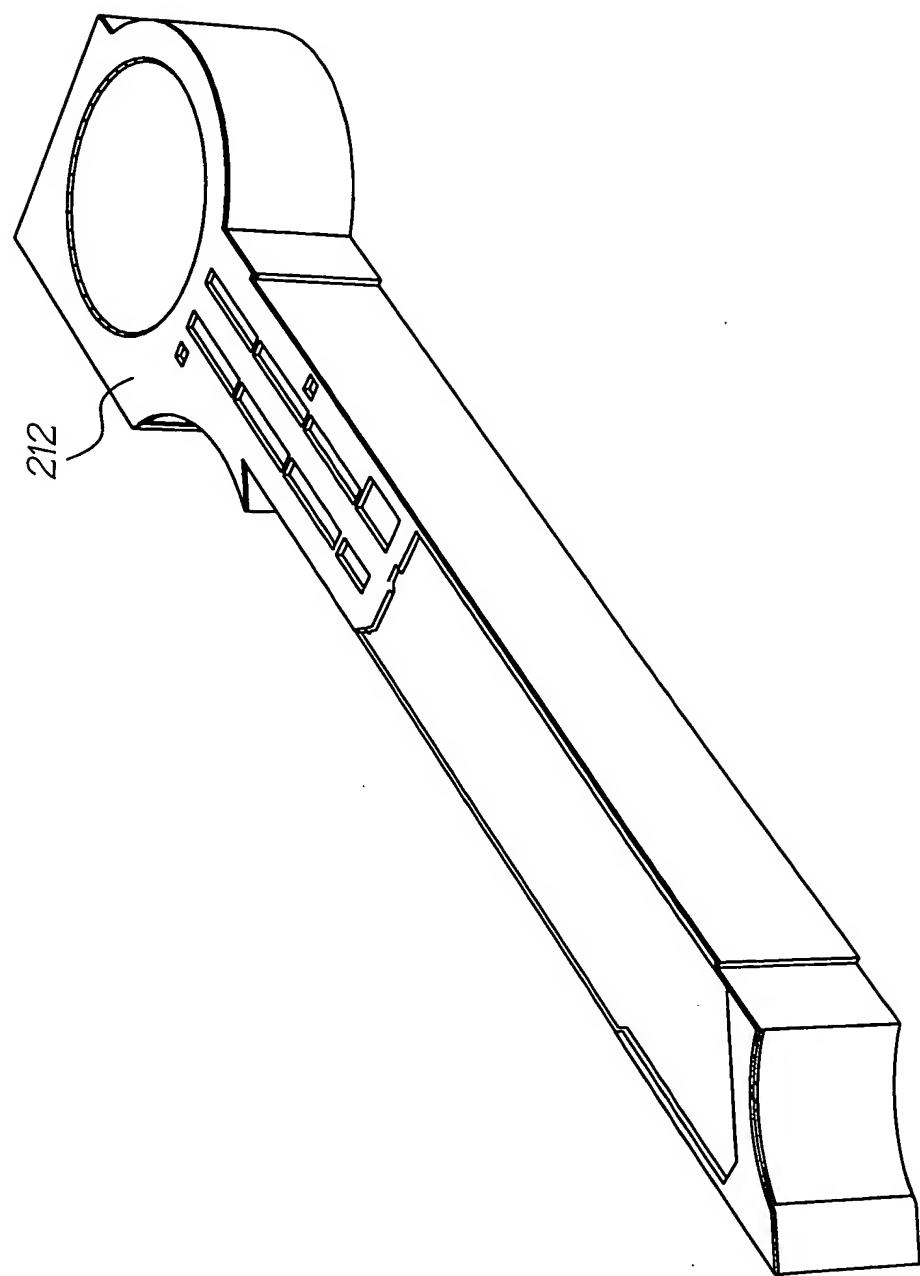


FIG. 24

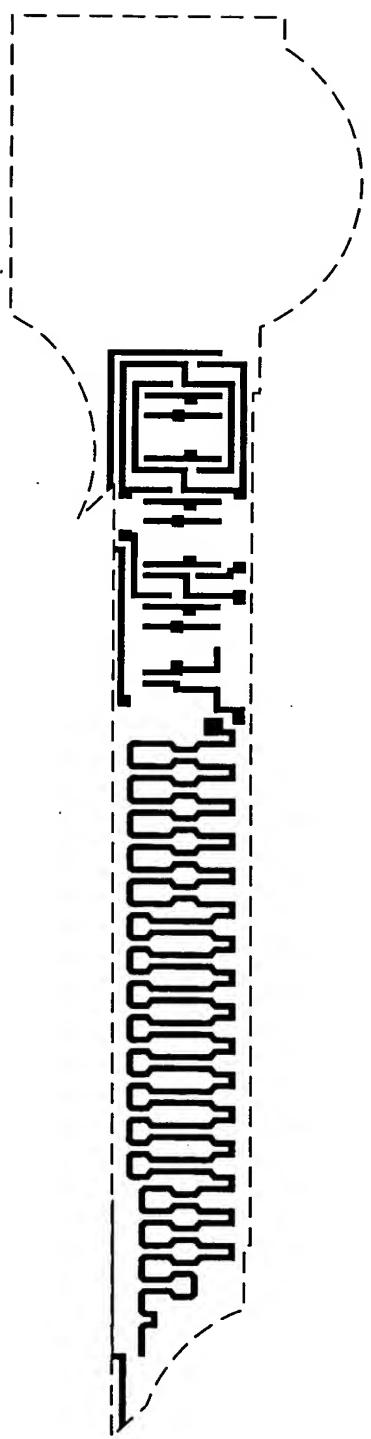


FIG. 25

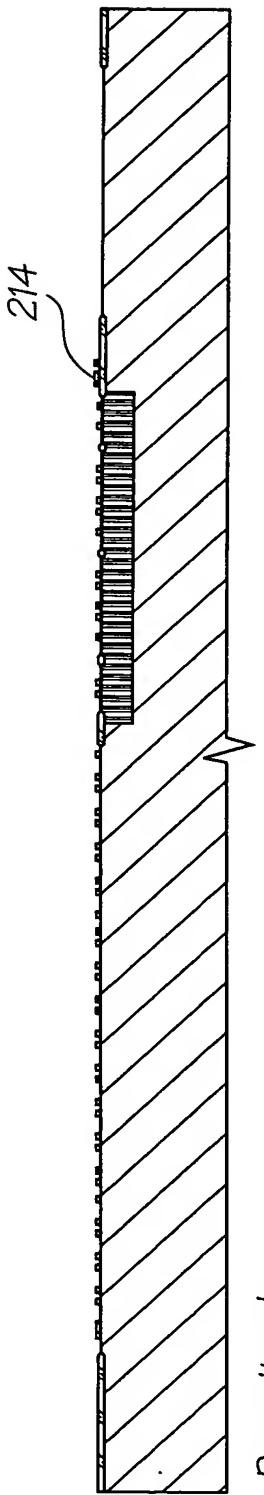


FIG. 26

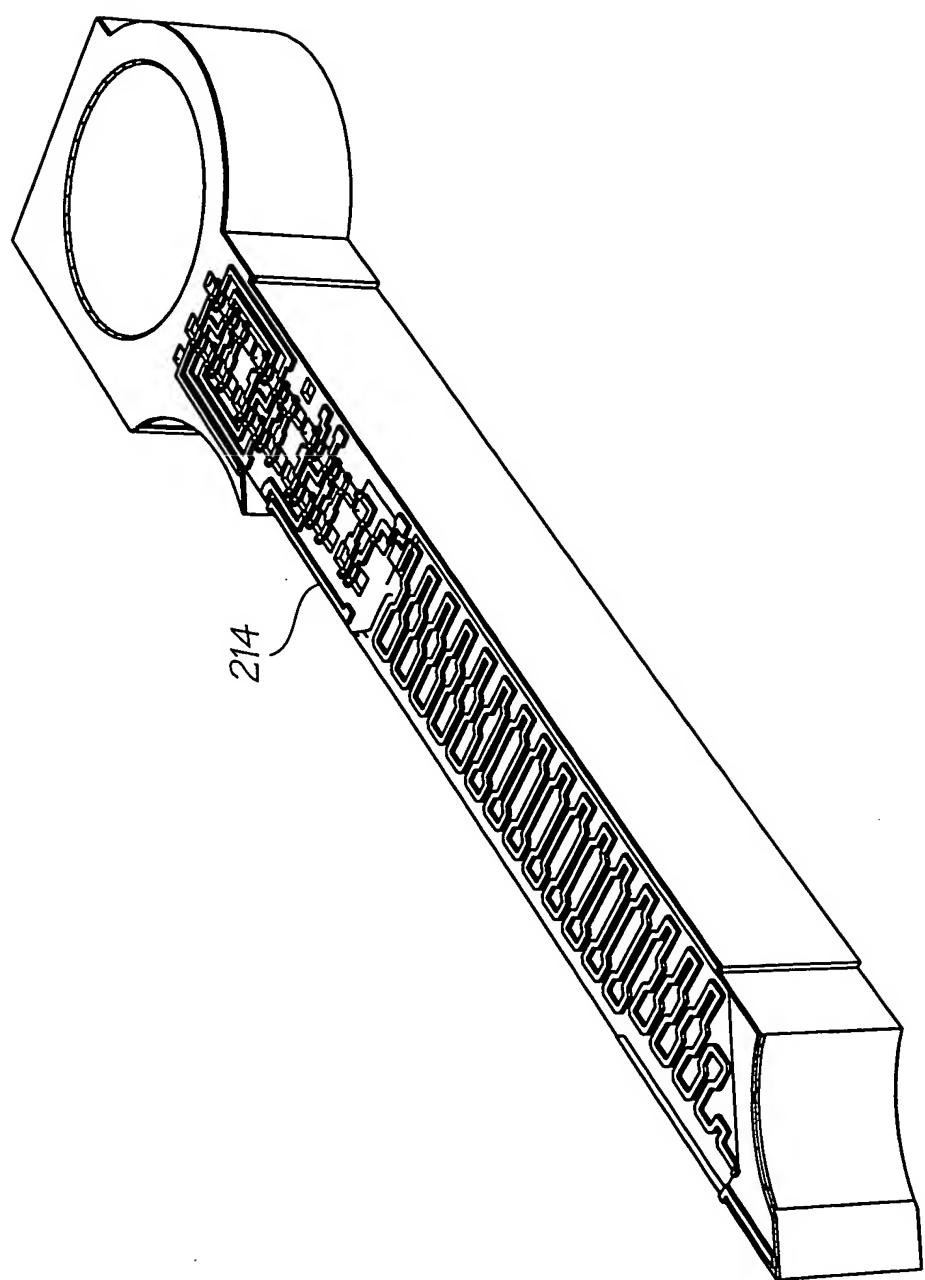
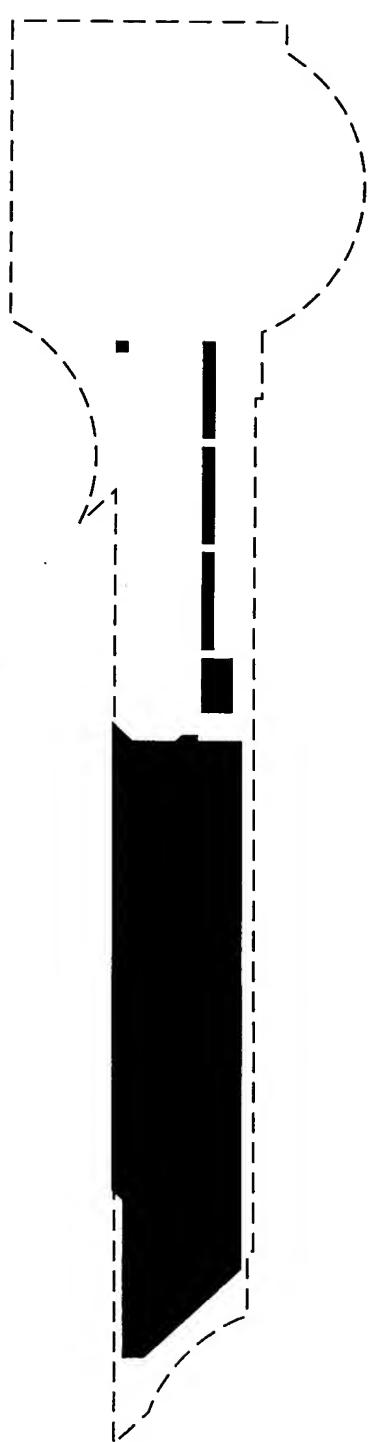
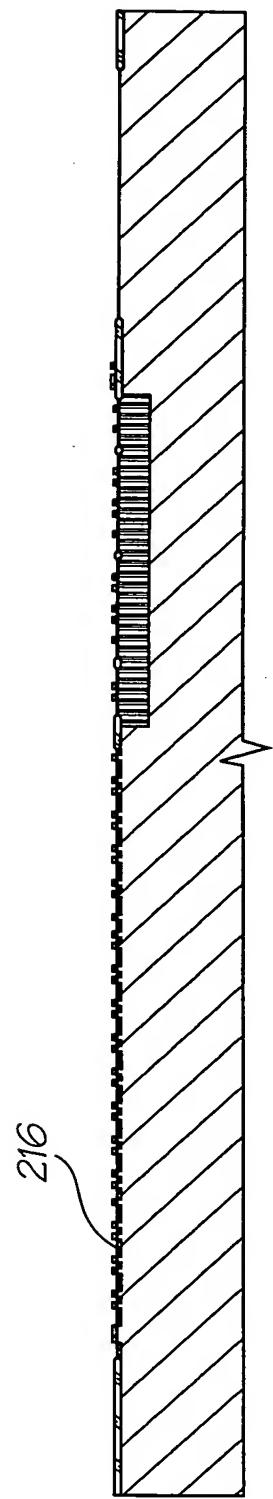


FIG. 27



$n+$  mask

FIG. 28



$n+$  implant

FIG. 29

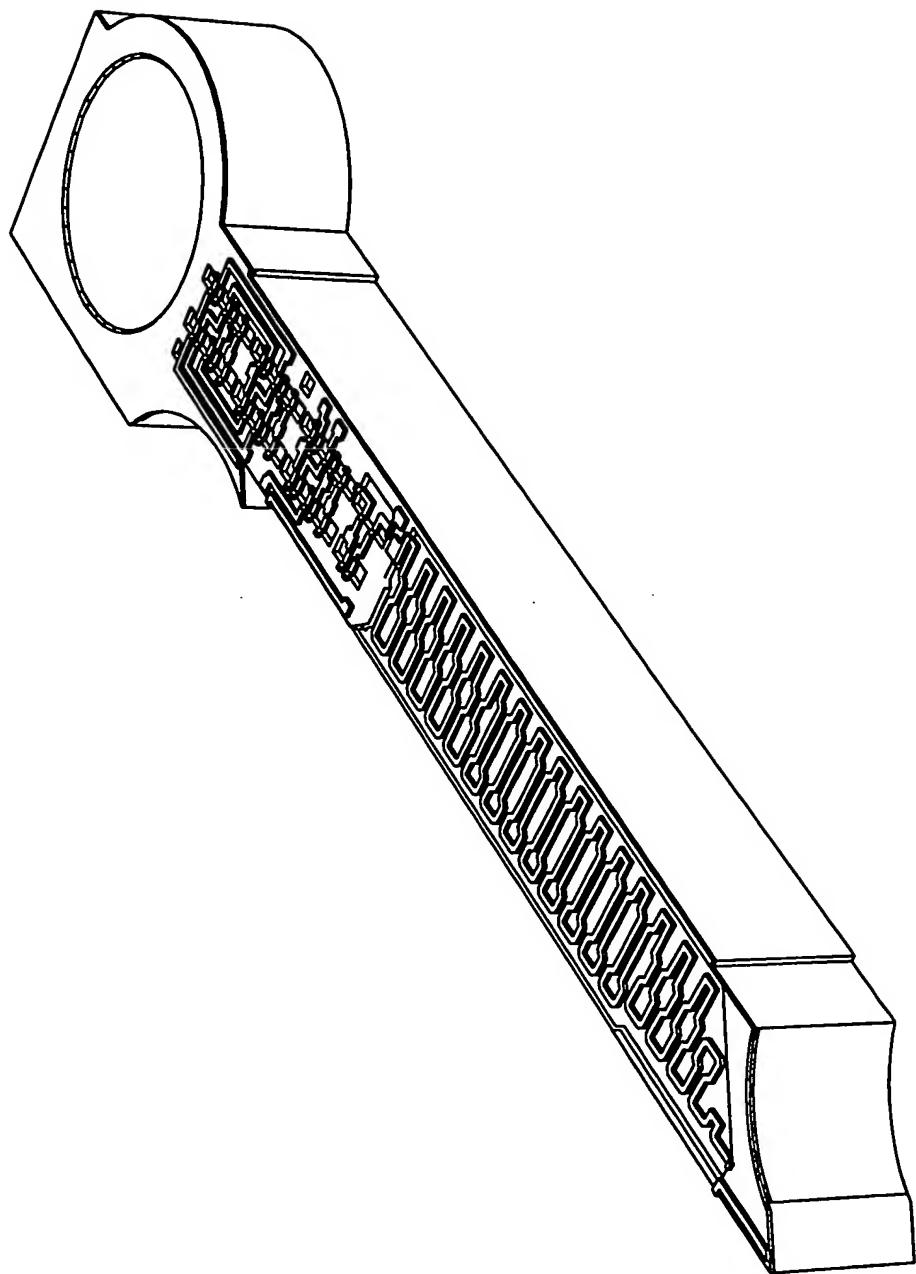


FIG. 30

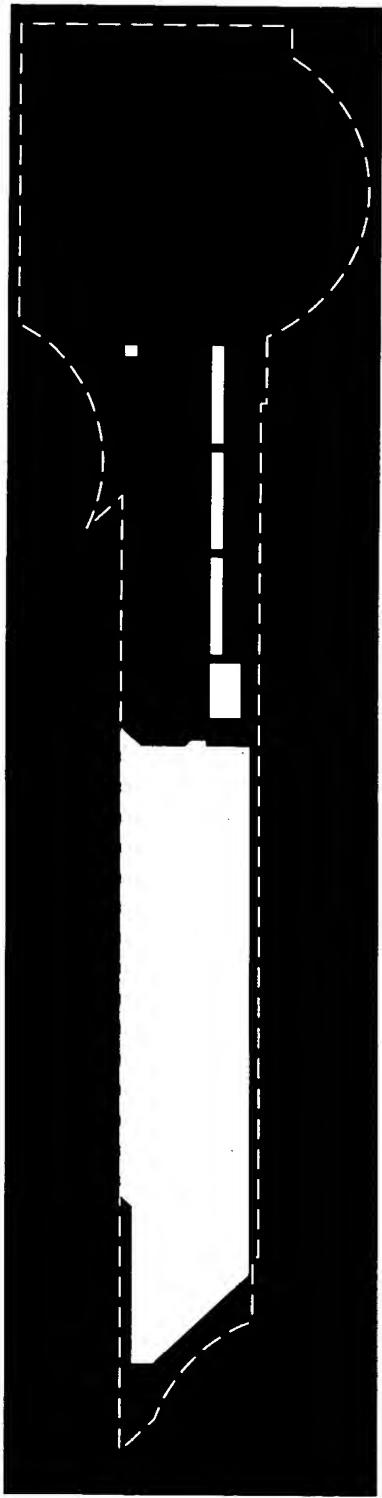


FIG. 31

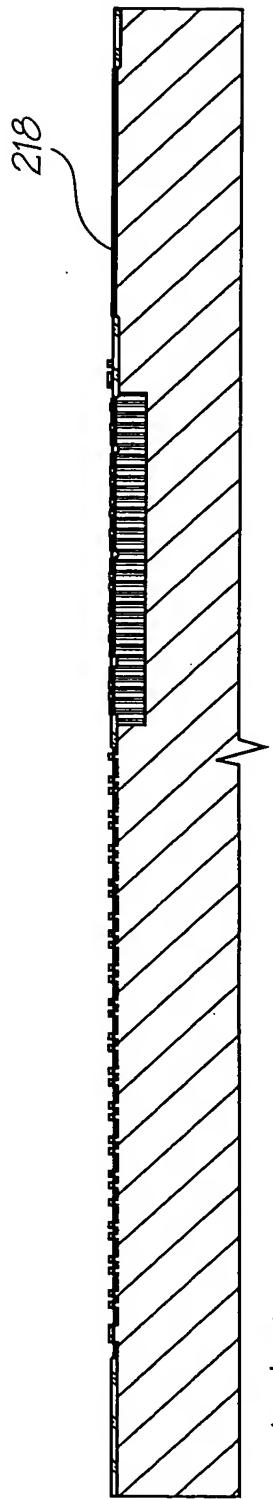


FIG. 32

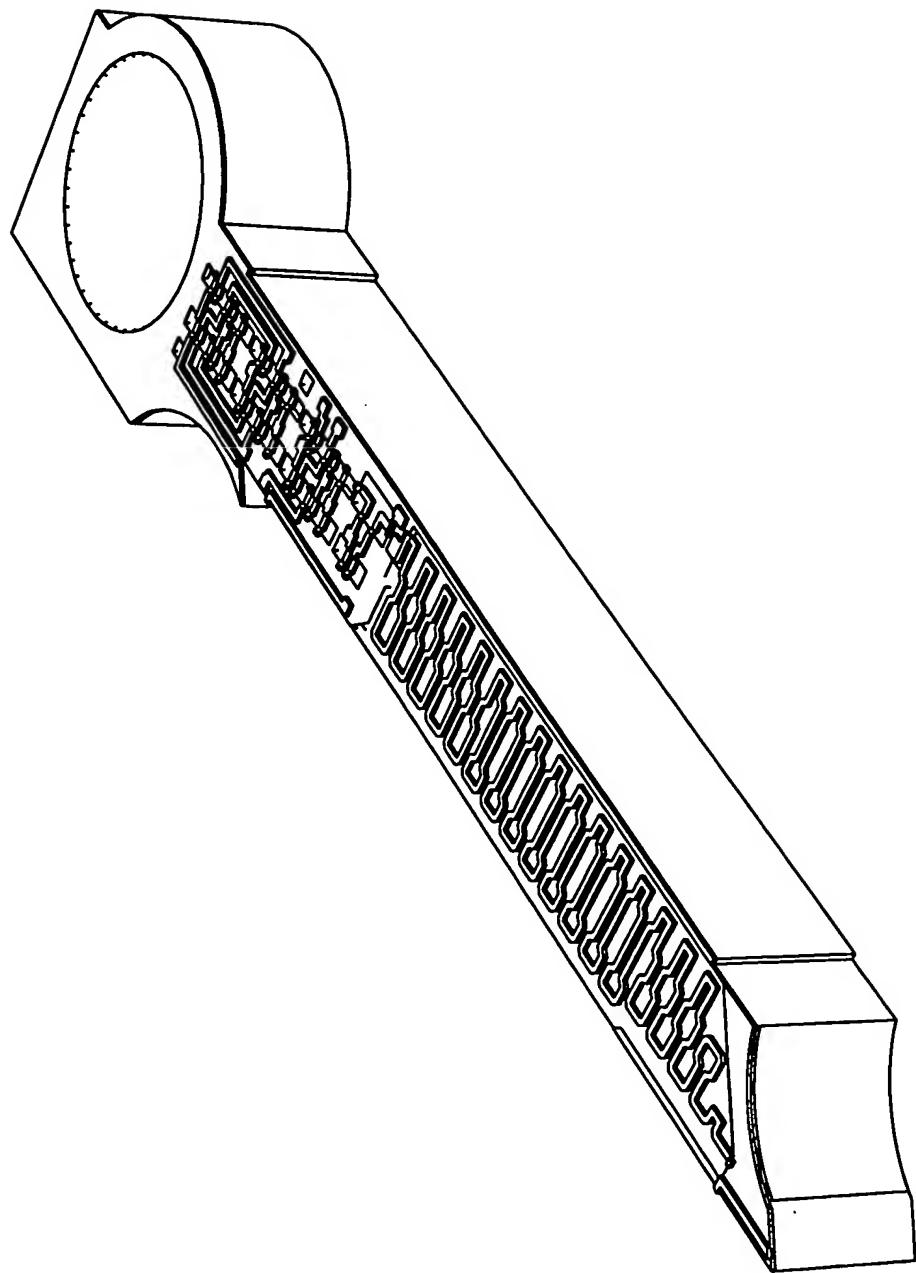
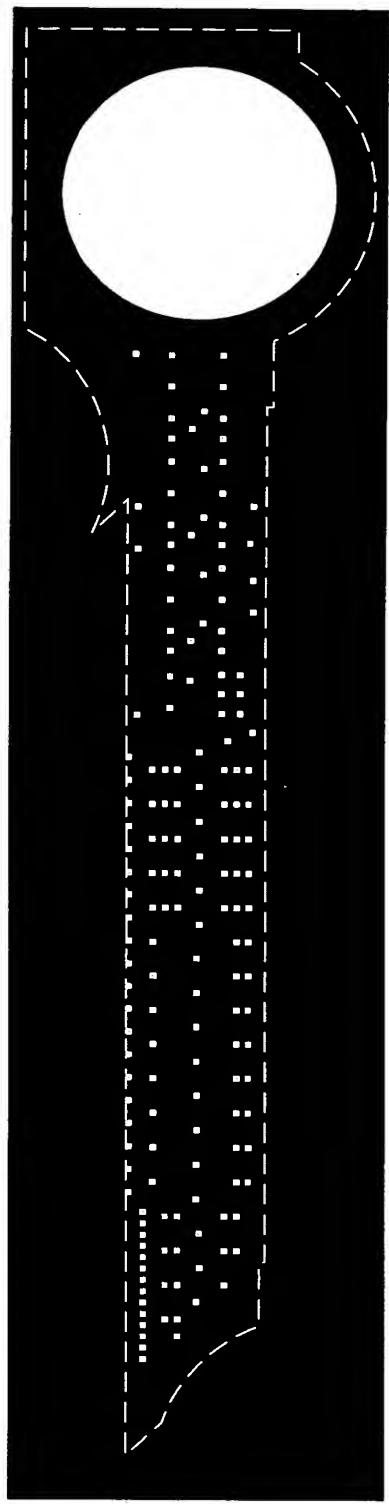
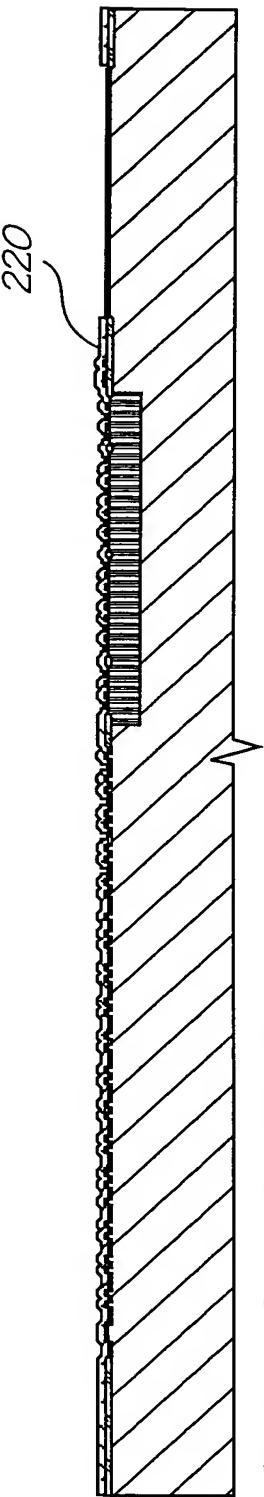


FIG. 33



*Contacts mask*

*FIG. 34*



*Deposit ILD 1, etch contacts*

*FIG. 35*

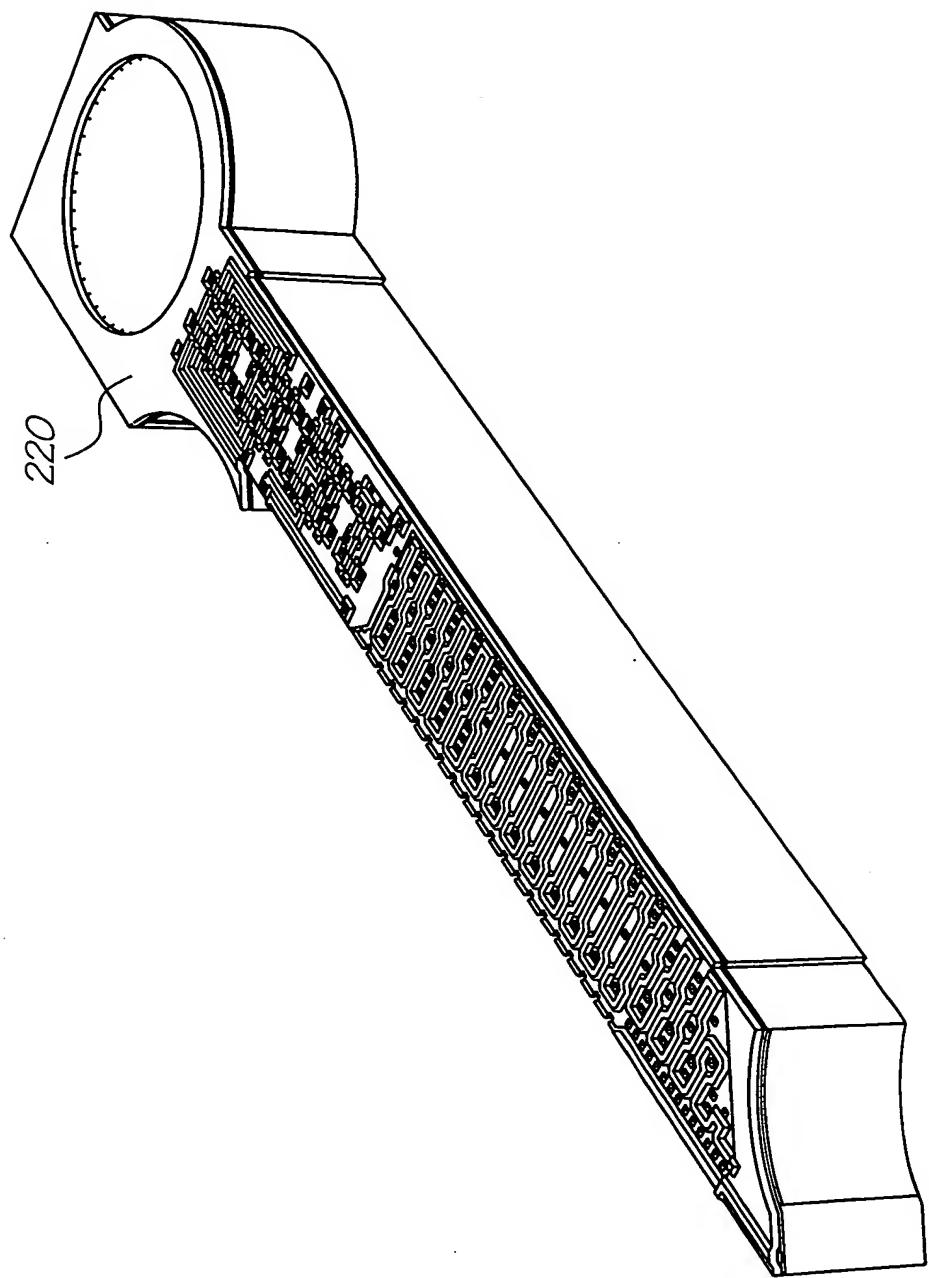
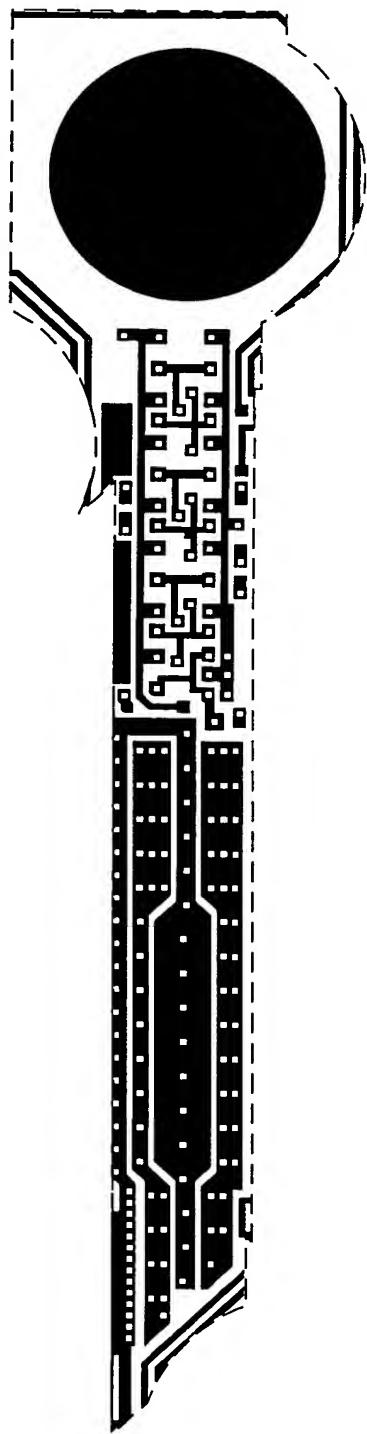
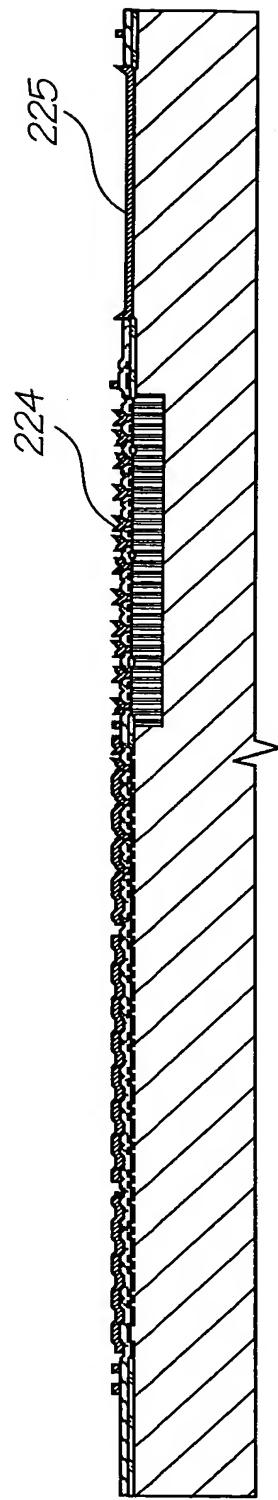


FIG. 36



Metal 1 mask

FIG. 37



Deposit Metal 1

FIG. 38

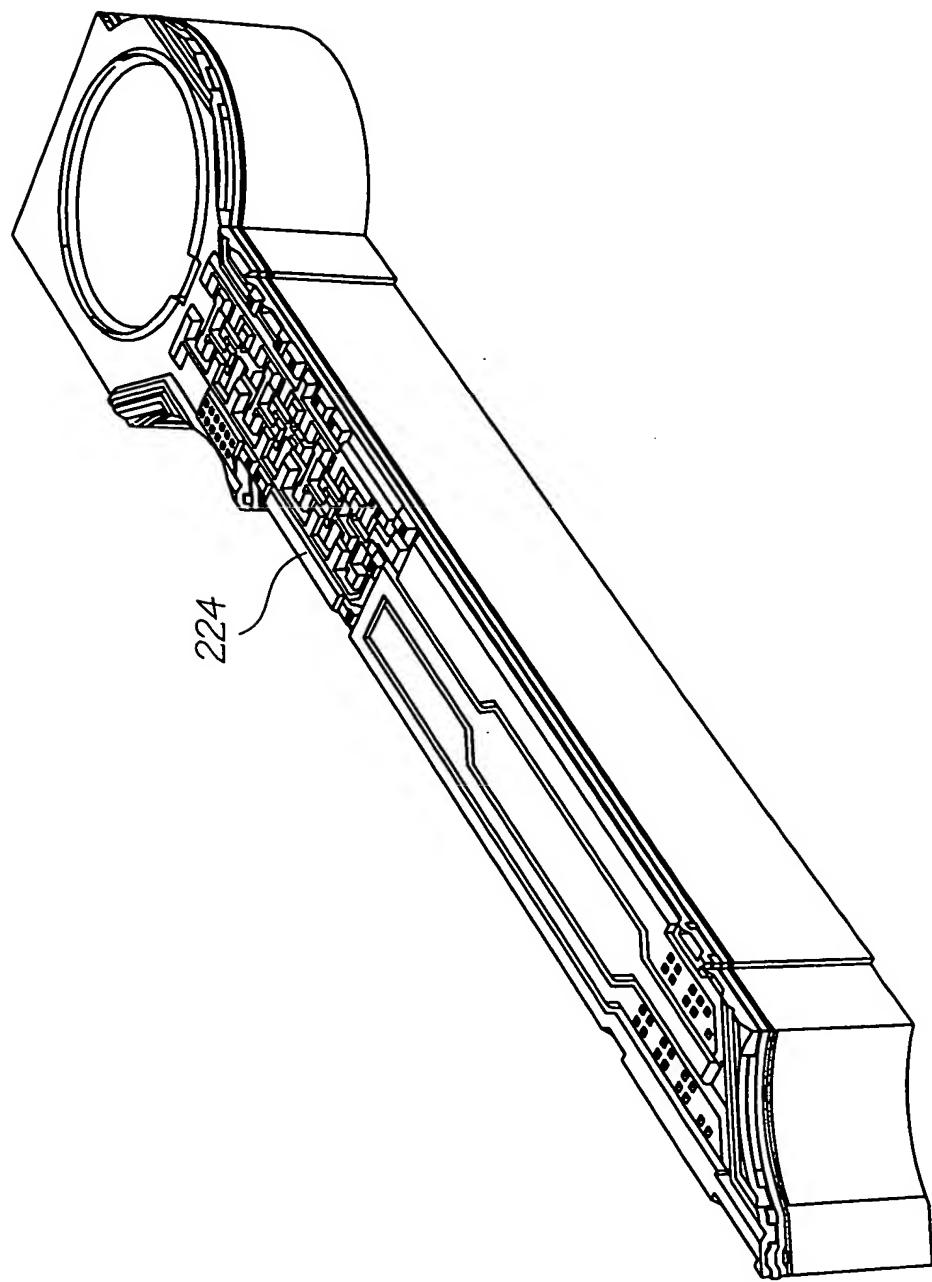
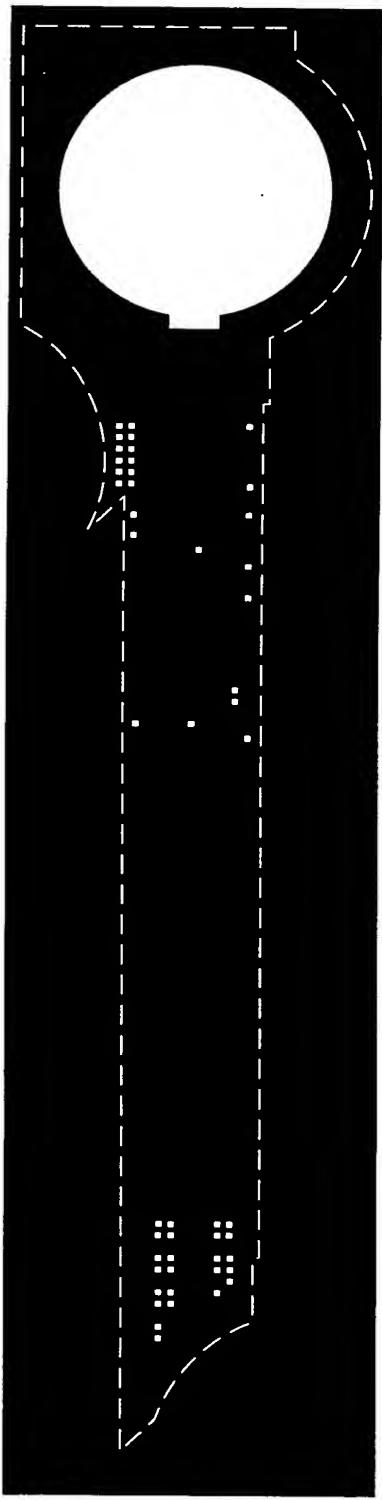
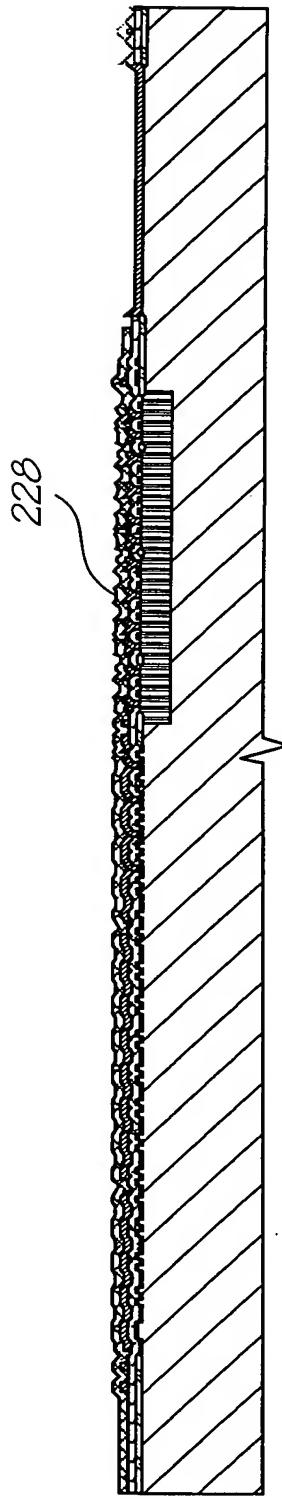


FIG. 39



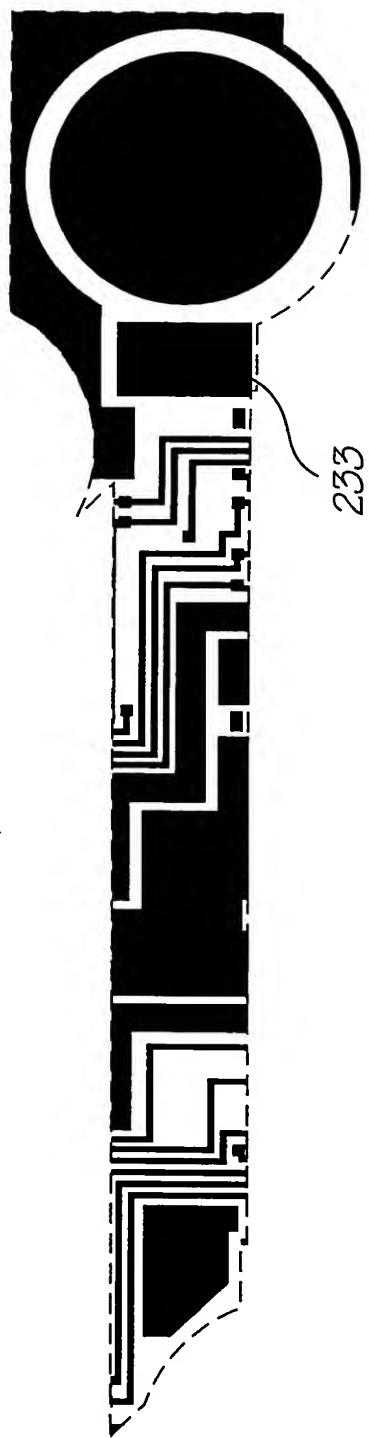
Via 1 mask

FIG. 40



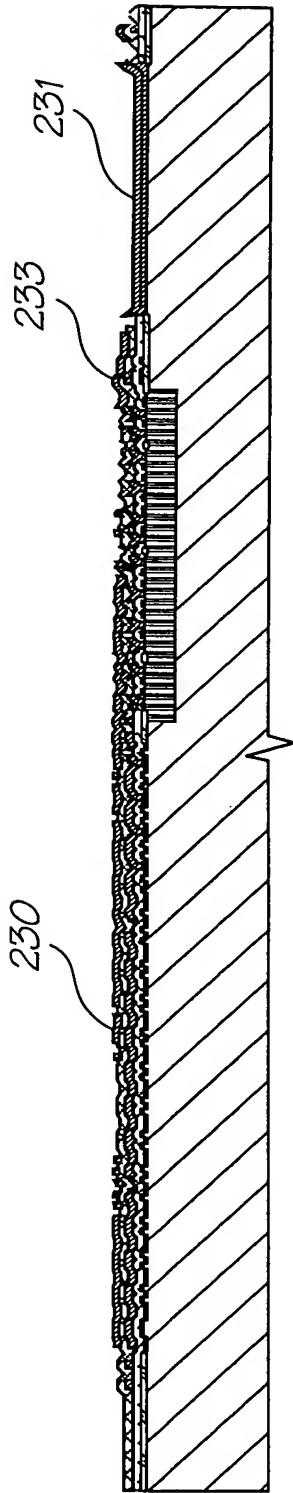
Deposit ILD 2, etch vias

FIG. 41



Metal 2 mask

FIG. 42



Deposit metal 2

FIG. 43

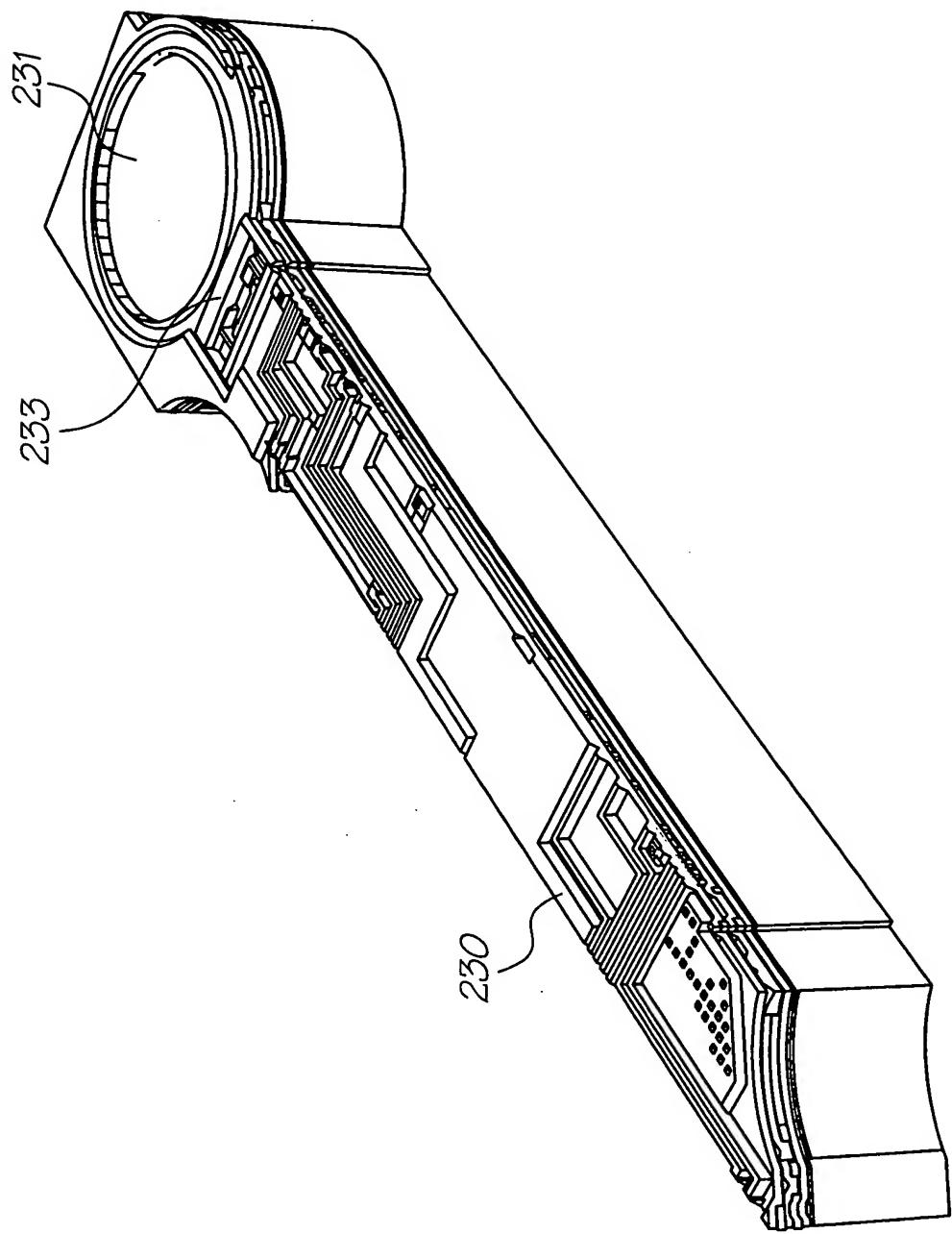
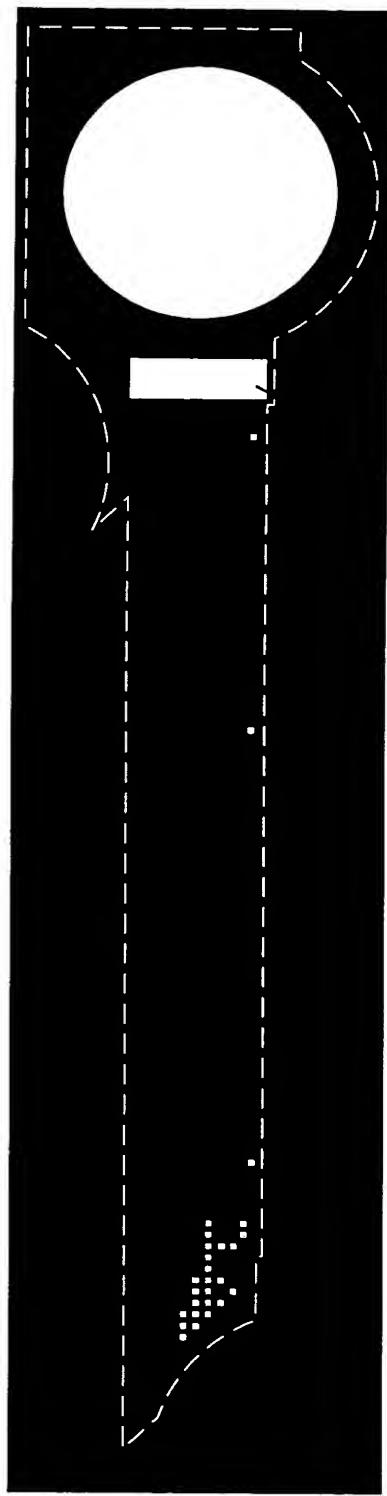
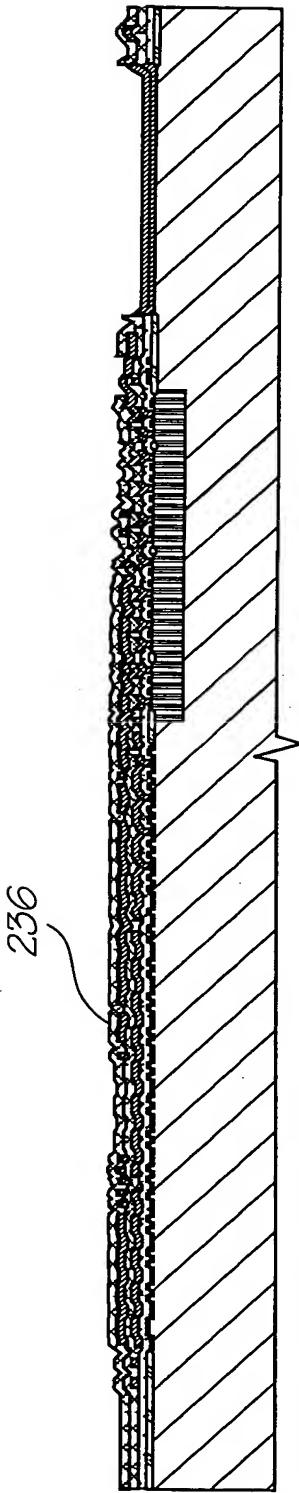


FIG. 44



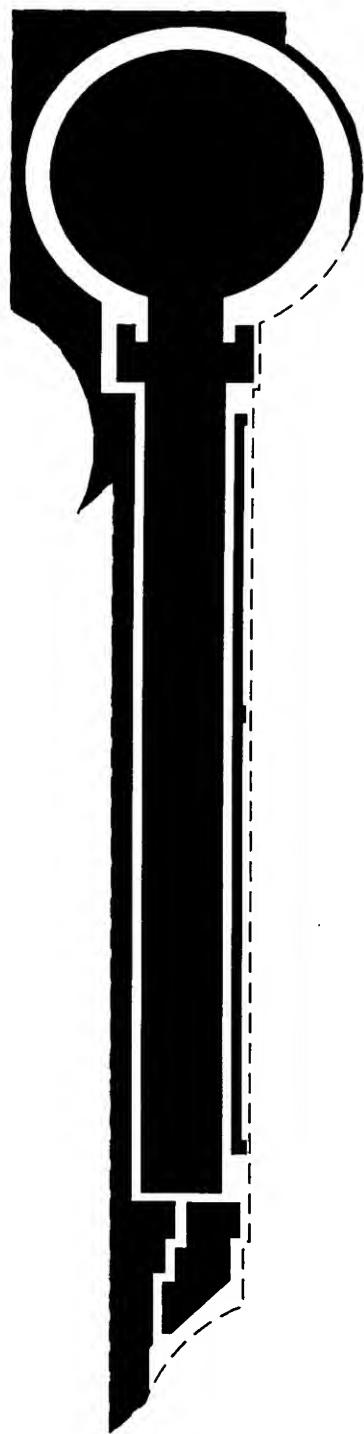
Via 2 mask

FIG. 45



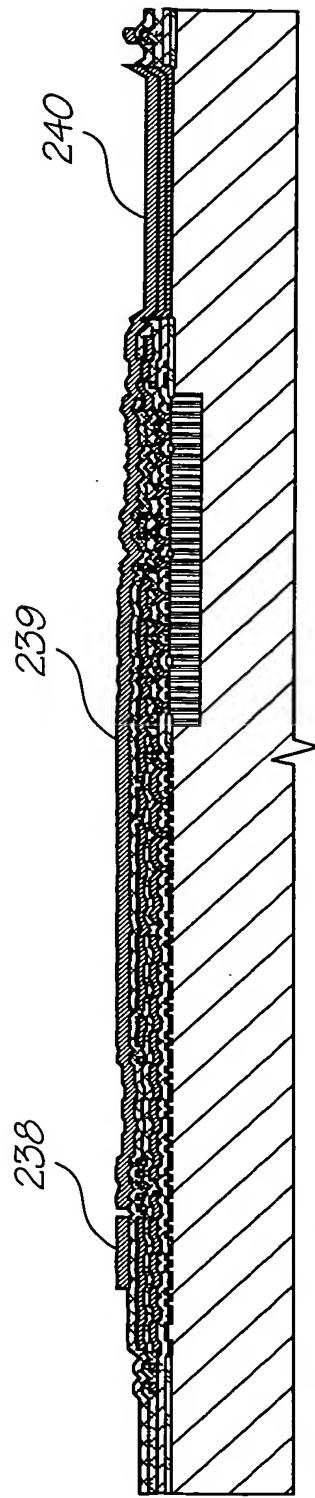
Deposit ILD 3, etch vias

FIG. 46



Metal 3 mask

FIG. 47



Deposit metal 3

FIG. 48

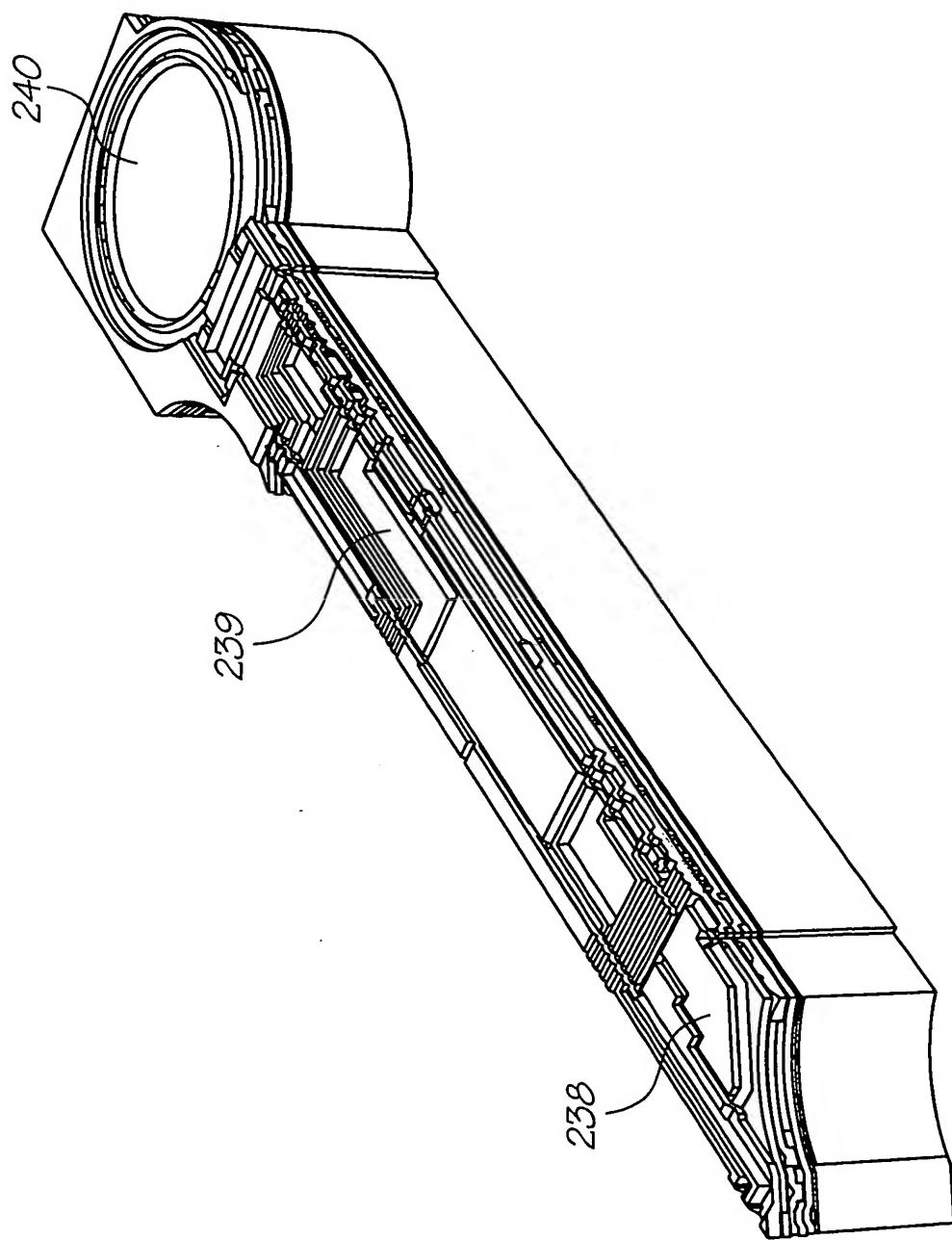
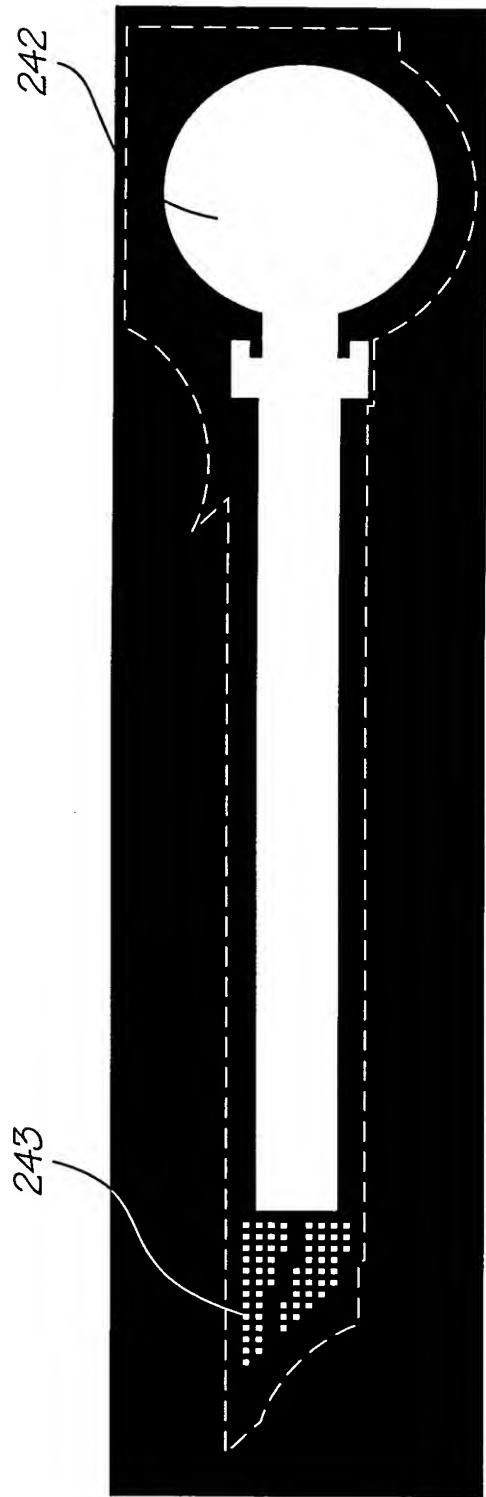
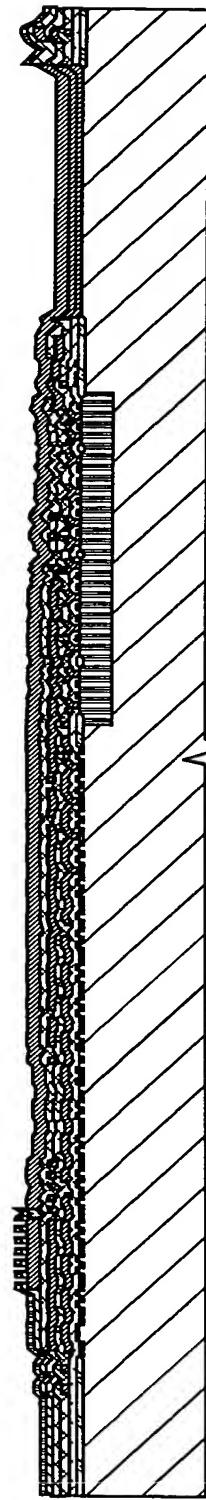


FIG. 49



Via 3 / Passivation mask

FIG. 50



Deposit passivation oxide & nitride, etch vias

FIG. 51

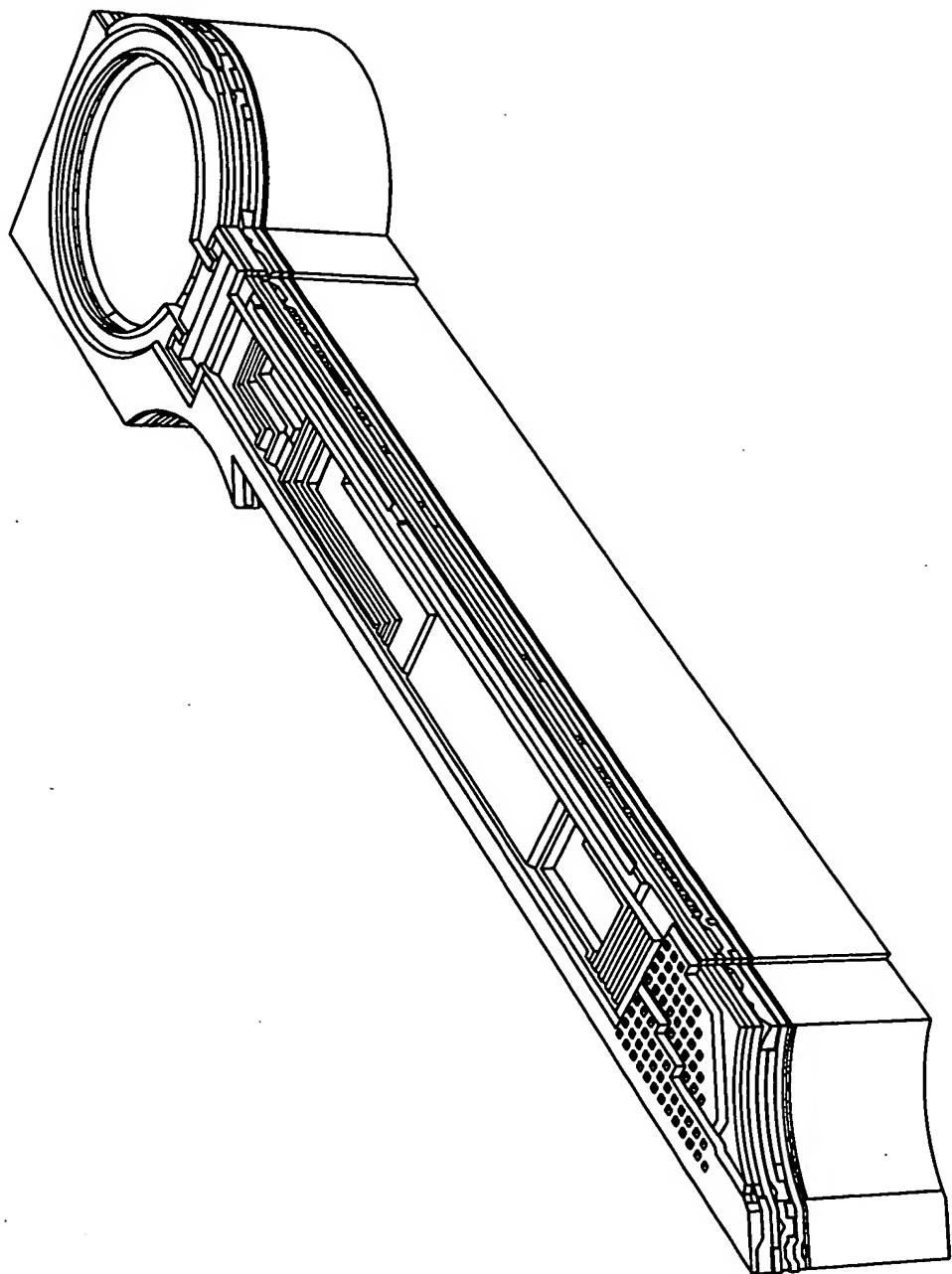
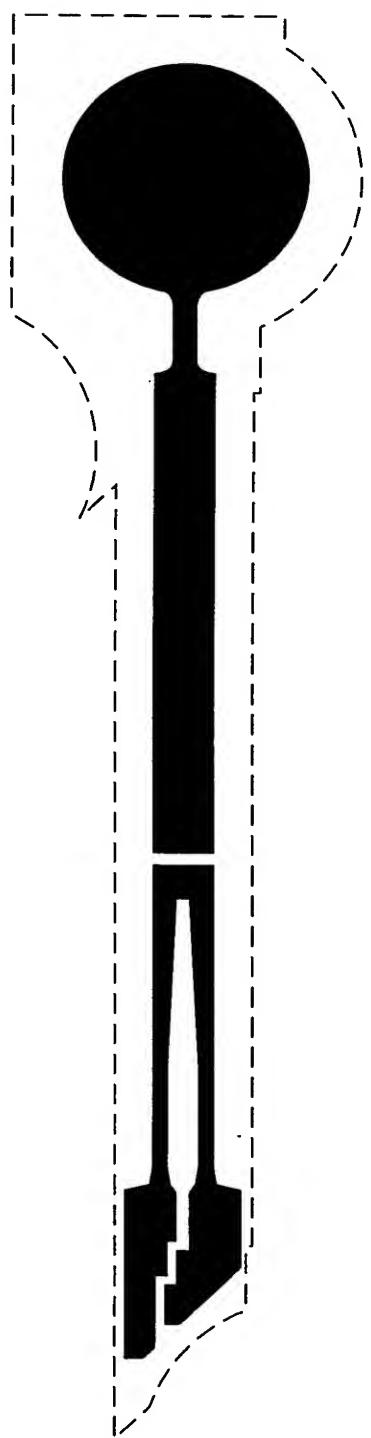
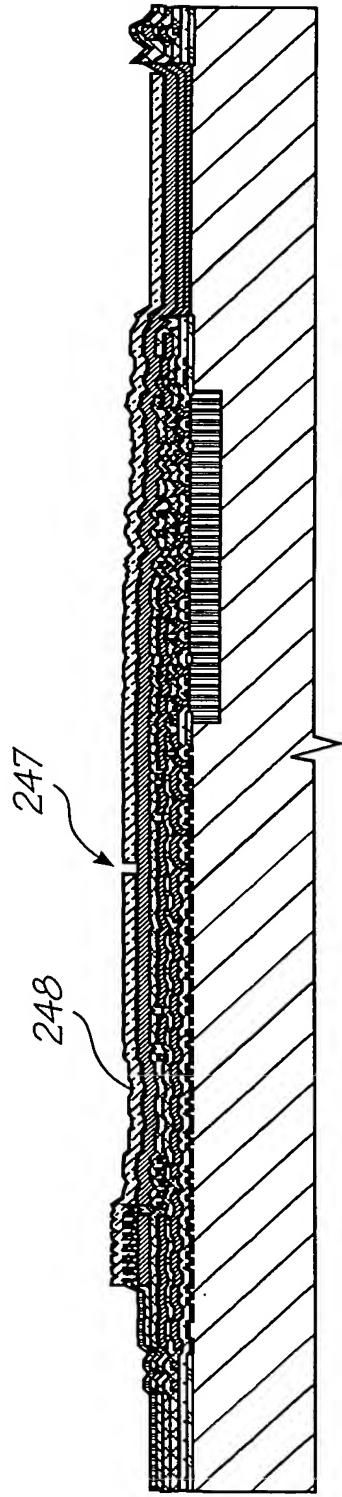


FIG. 52



Heater mask

FIG. 53



Deposit heater TIN

FIG. 54

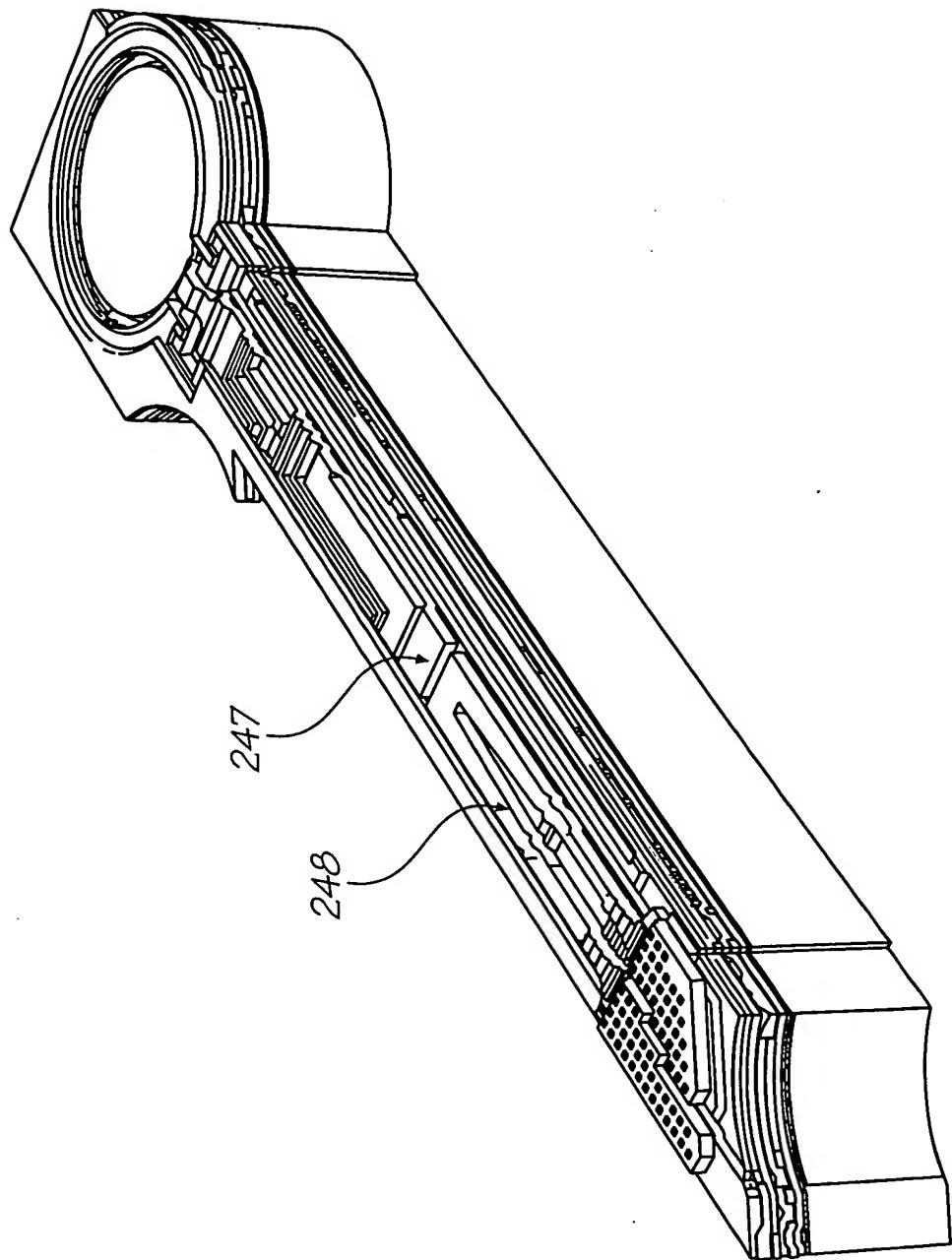
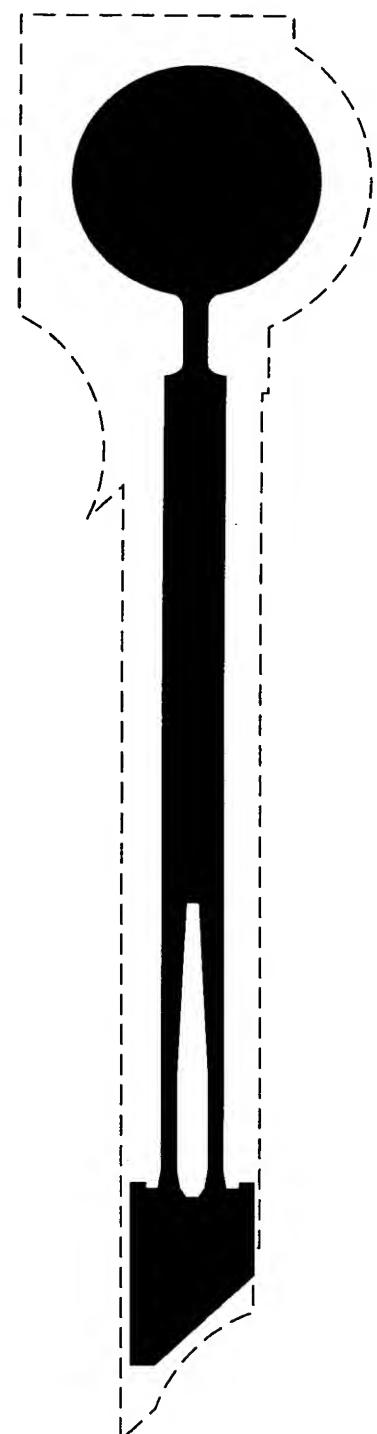
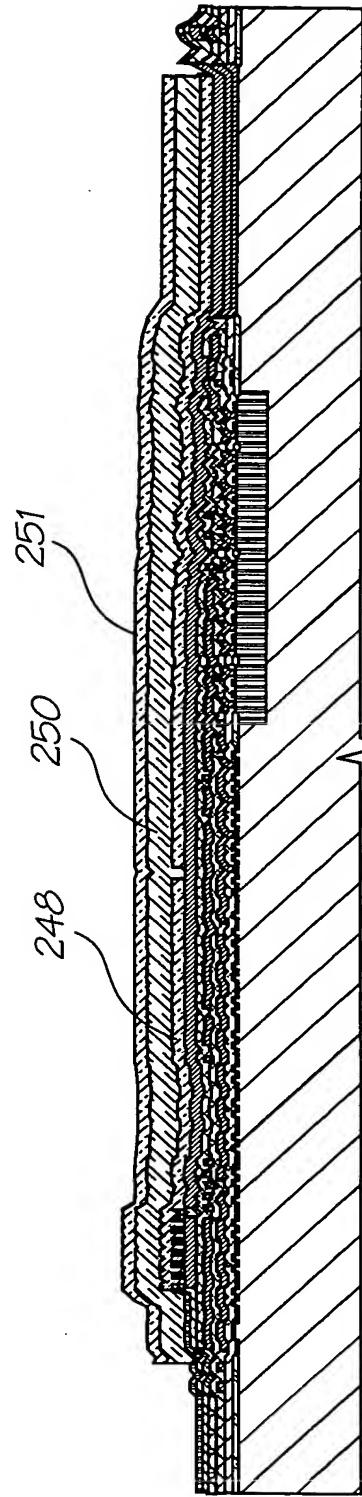


FIG. 55



Actuator / bend compensator mask

FIG. 56



Deposit actuator glass and bend compensator TiN, etch together

FIG. 57

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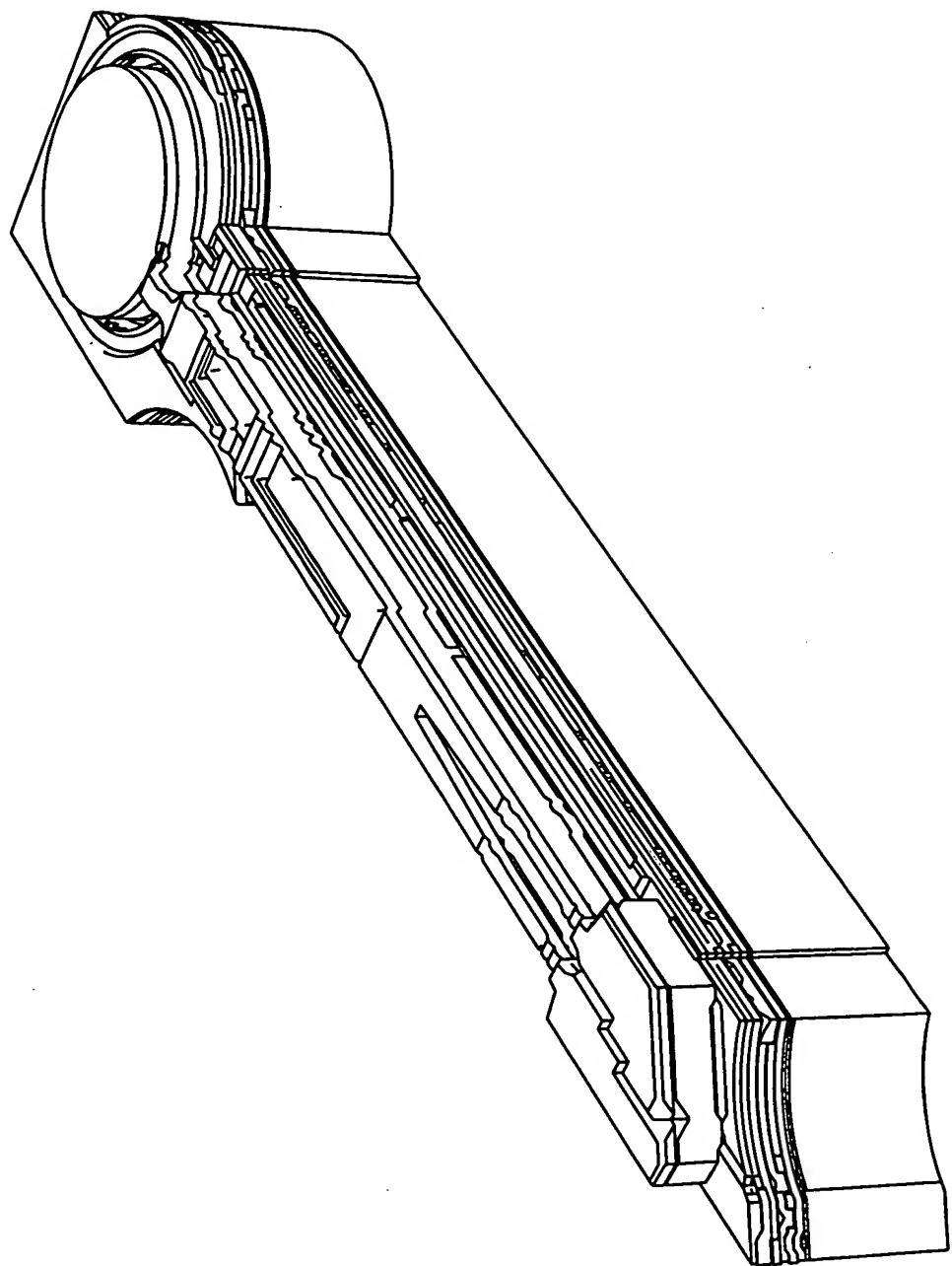
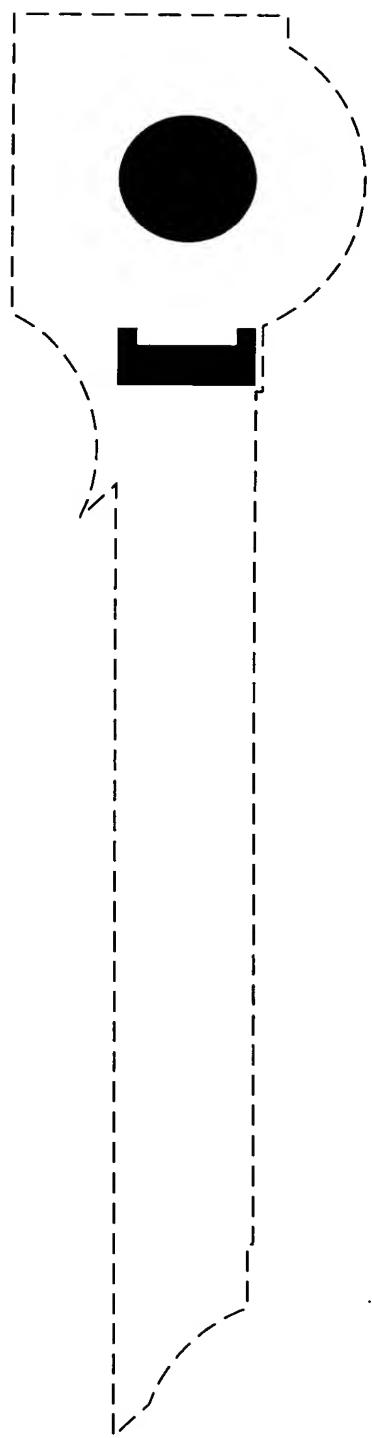
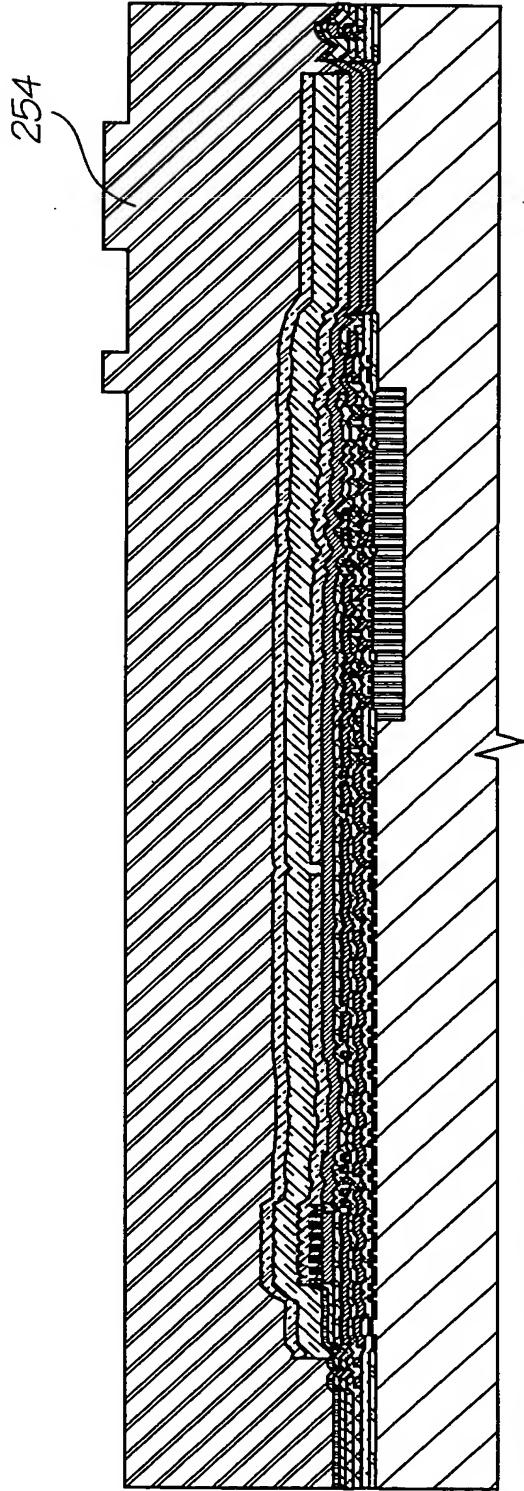


FIG. 58



Nozzle mask

FIG. 59



Deposit sacrificial layer, etch nozzles

FIG. 60

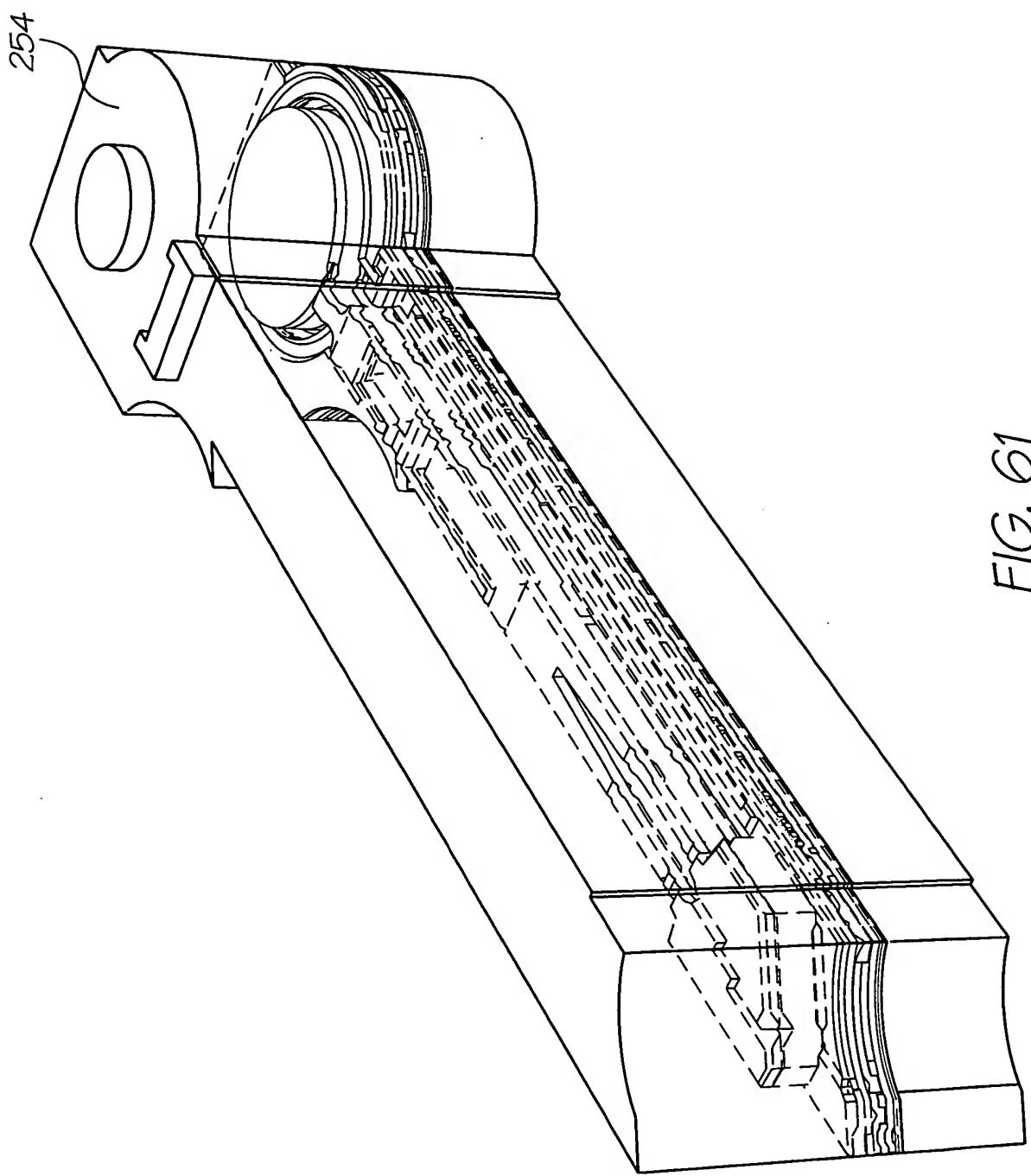
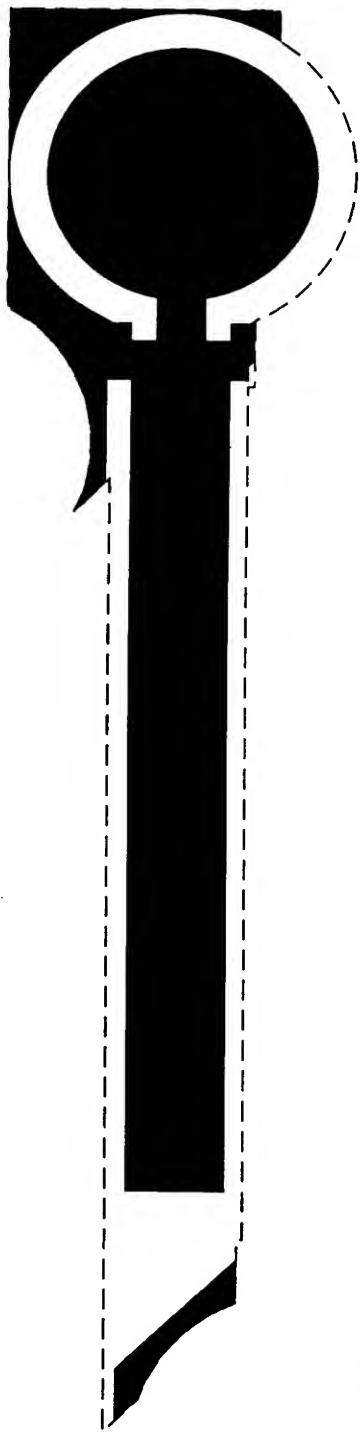
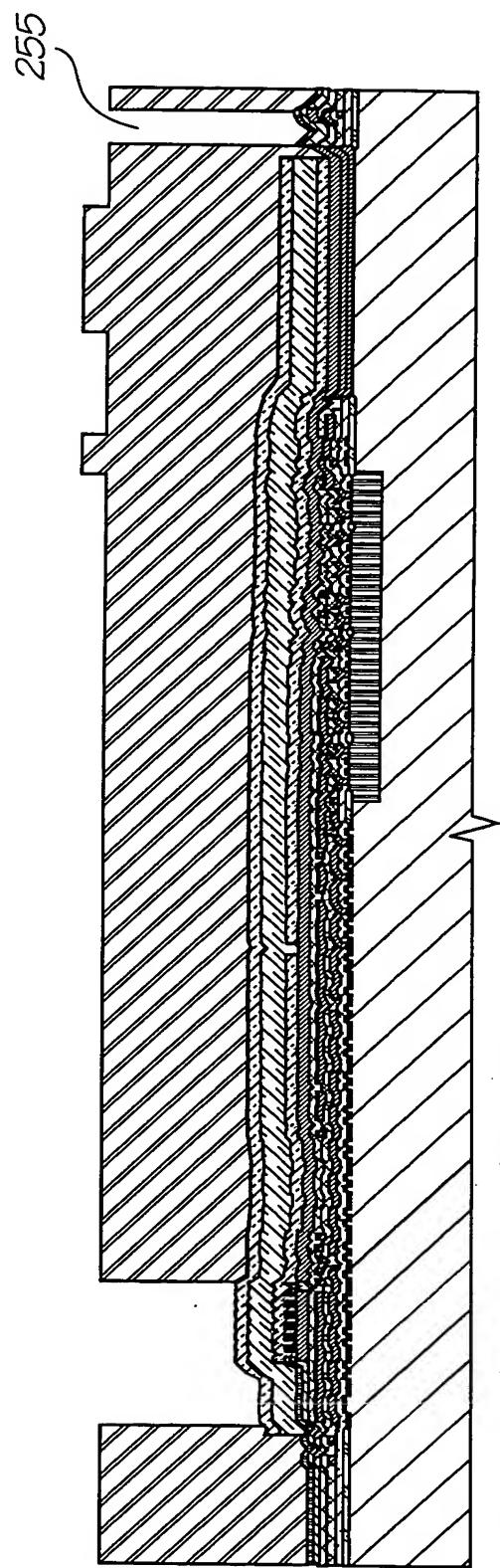


FIG. 61



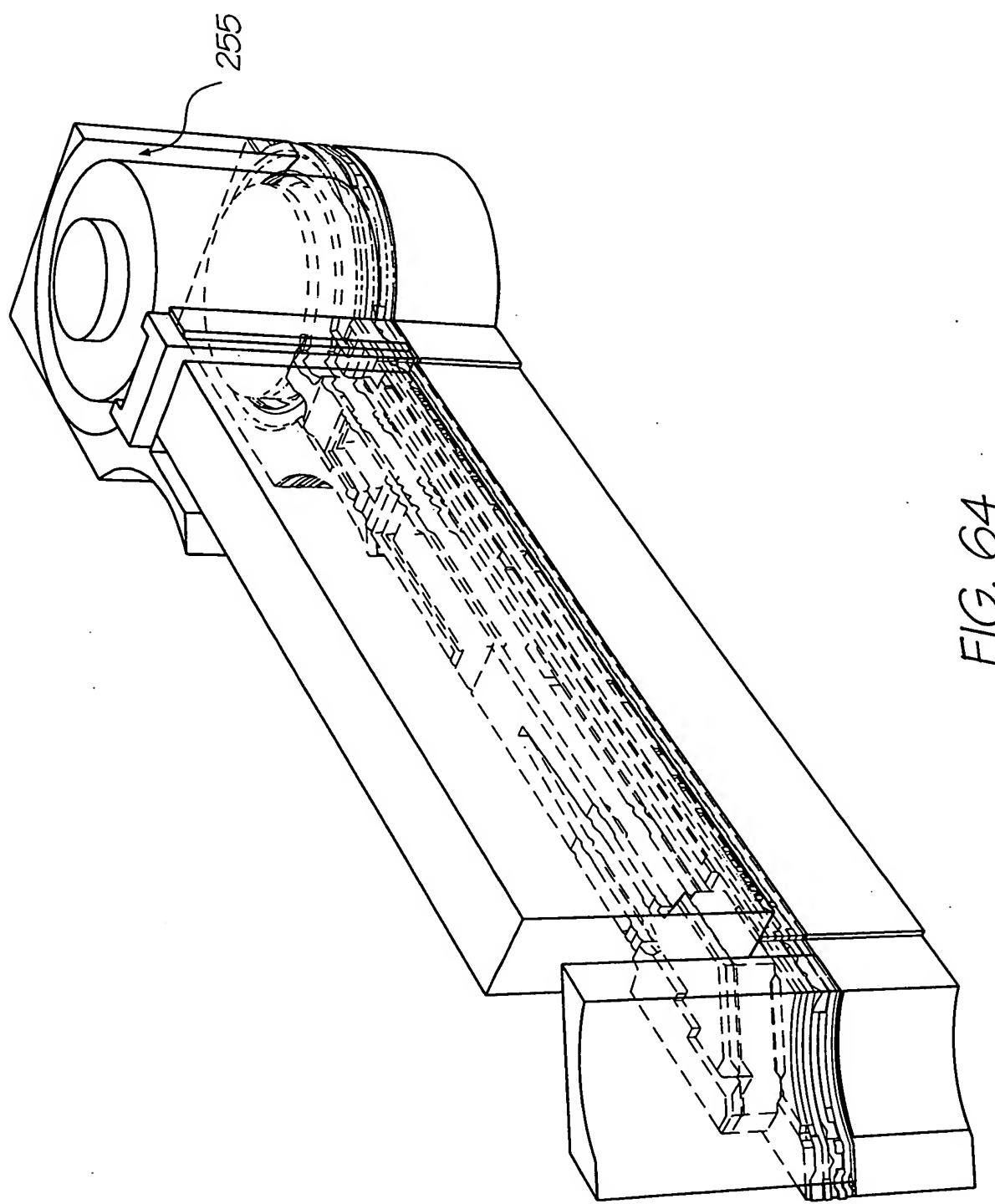
Chamber mask

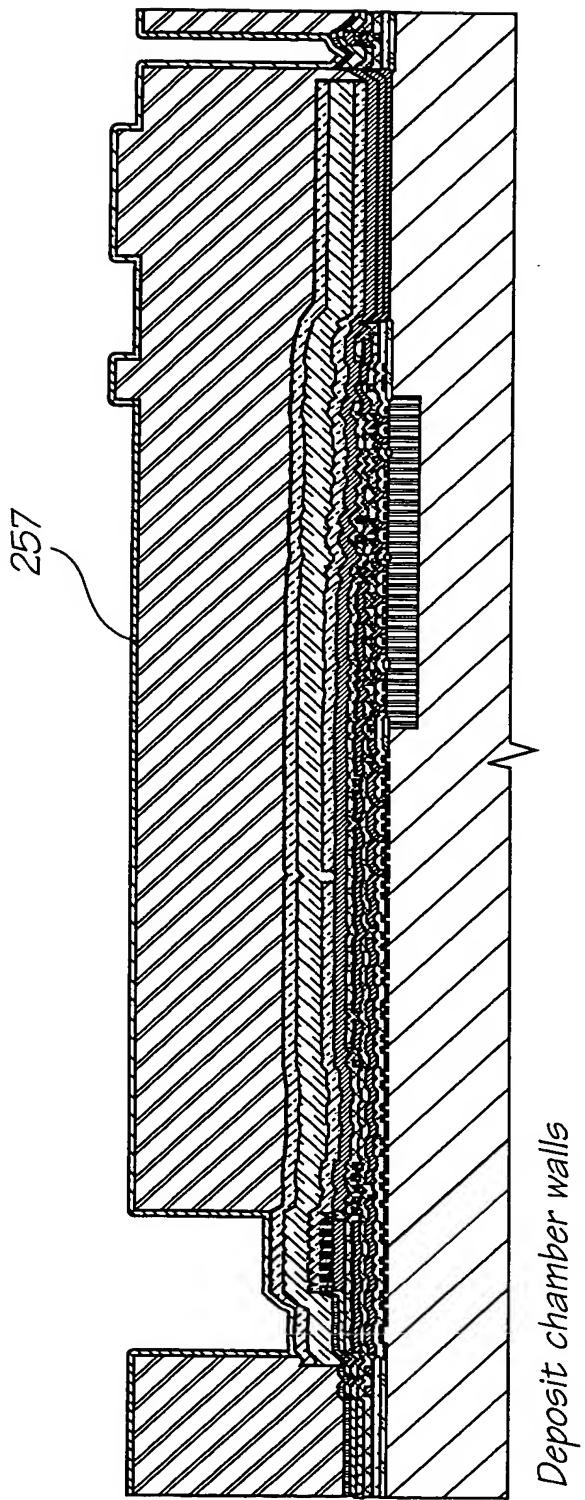
FIG. 62



Etch chambers in sacrificial layer

FIG. 63





Deposit chamber walls

FIG. 65

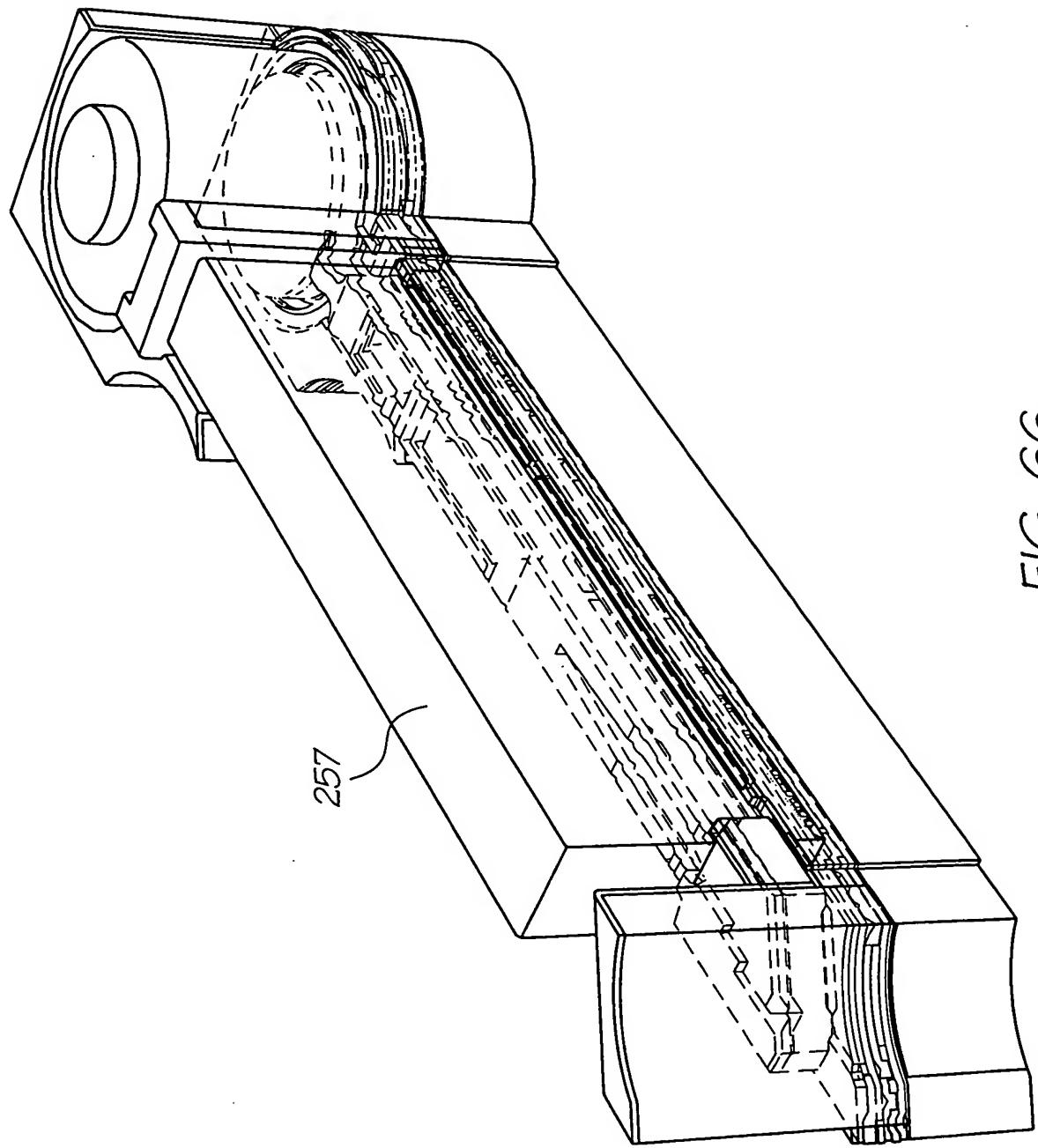
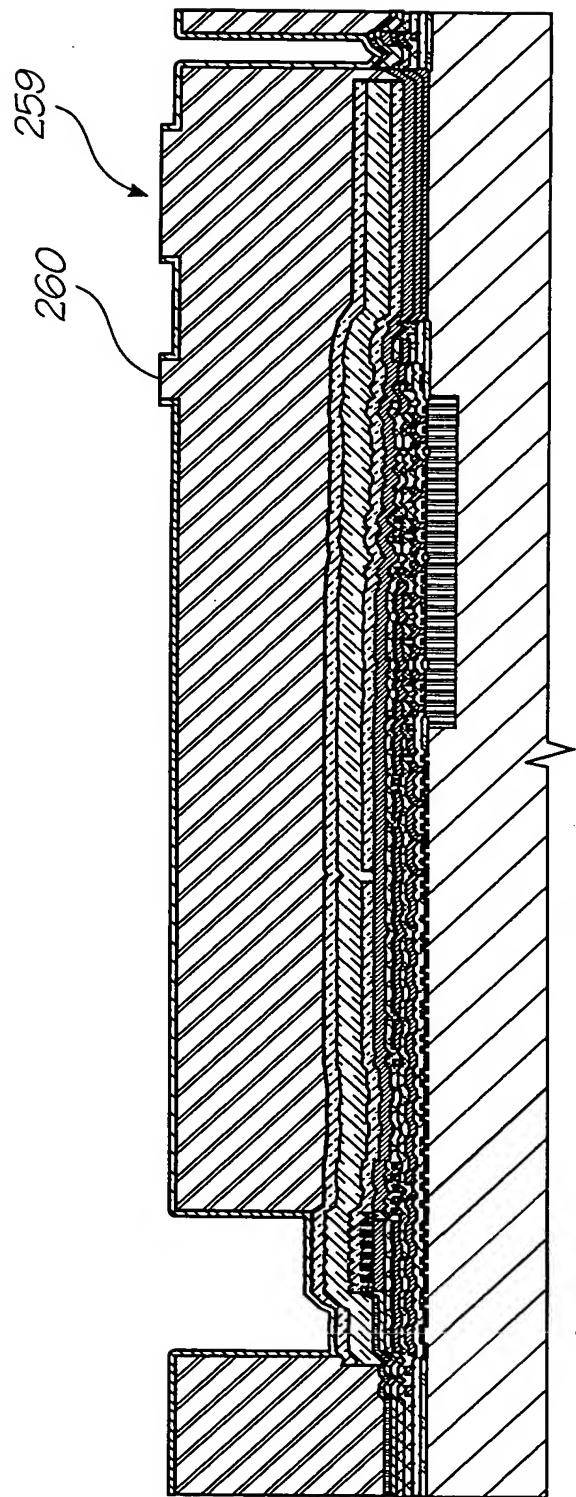


FIG. 66



*Form self-aligned nozzles using CMP*

FIG. 67

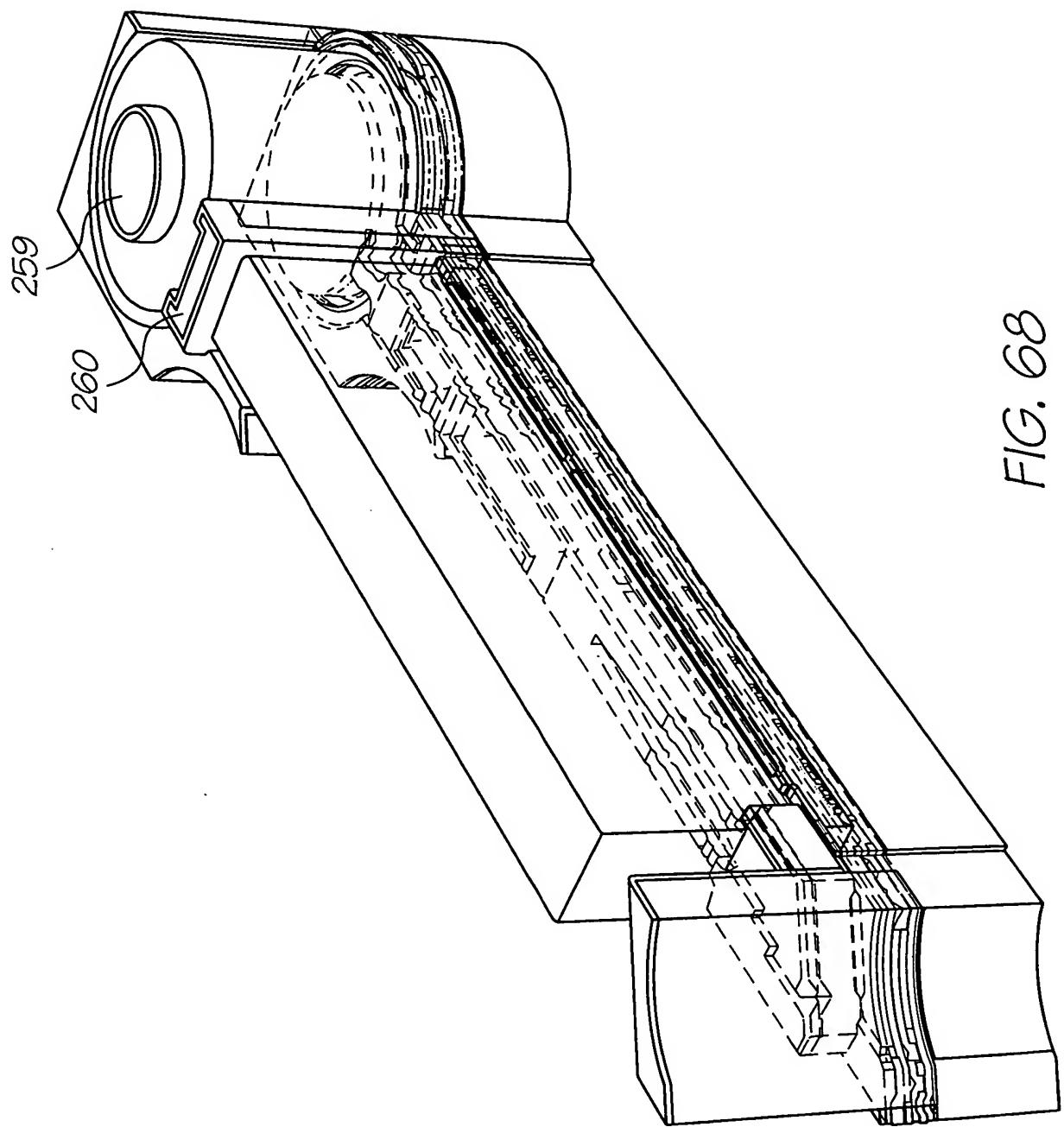
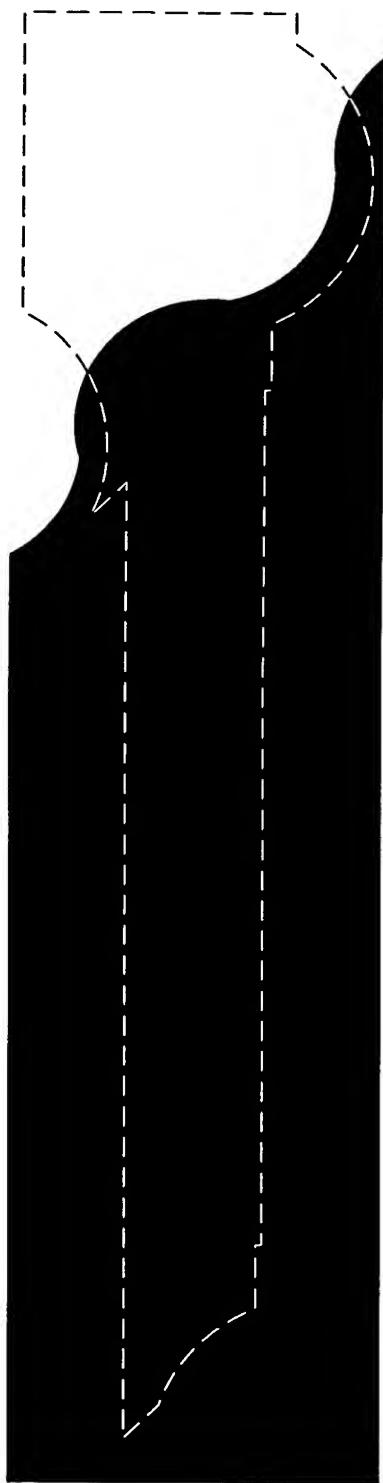
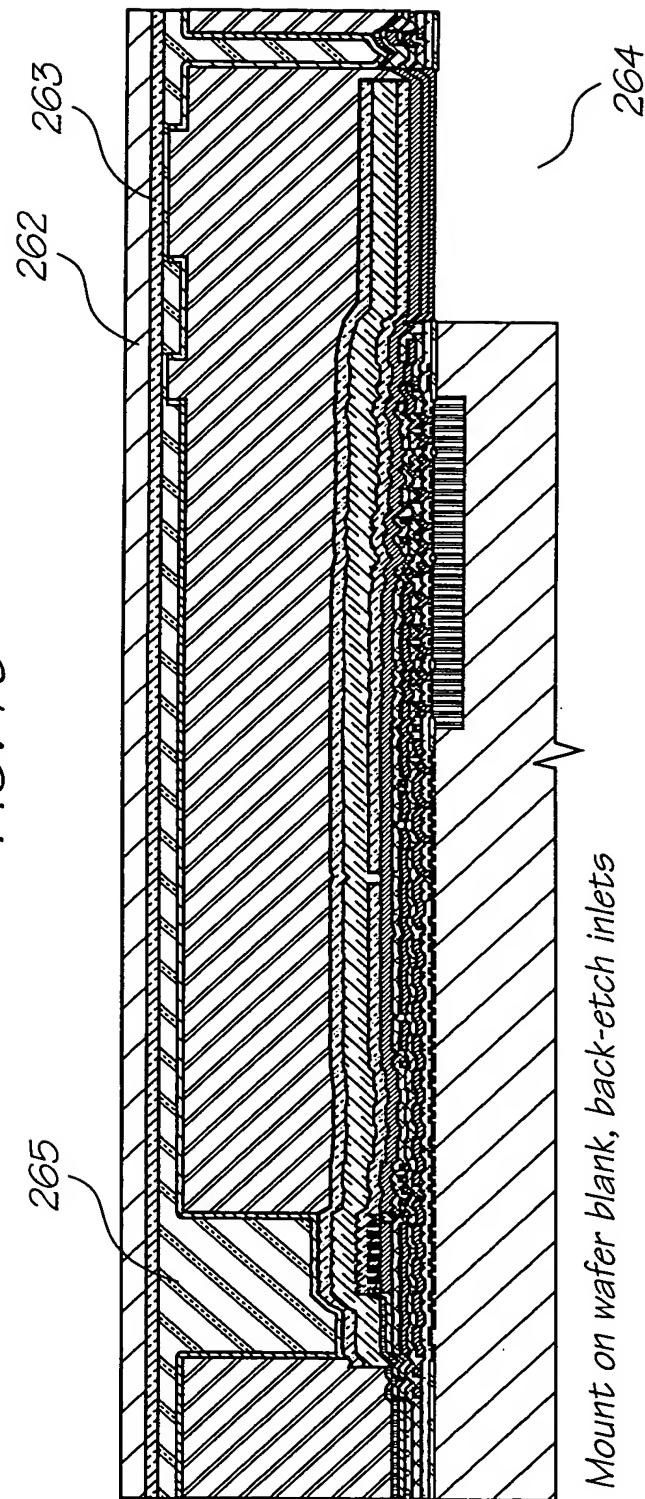


FIG. 68



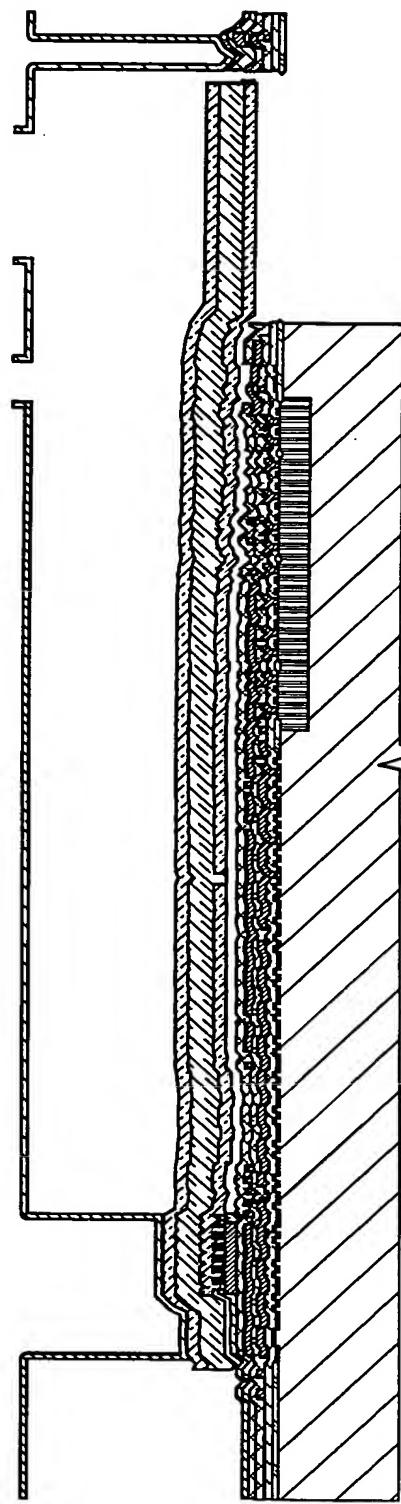
Back-etch inlet mask

FIG. 70



Mount on wafer blank, back-etch inlets

FIG. 69



*Detach from wafer blank, etch sacrificial material*

FIG. 71

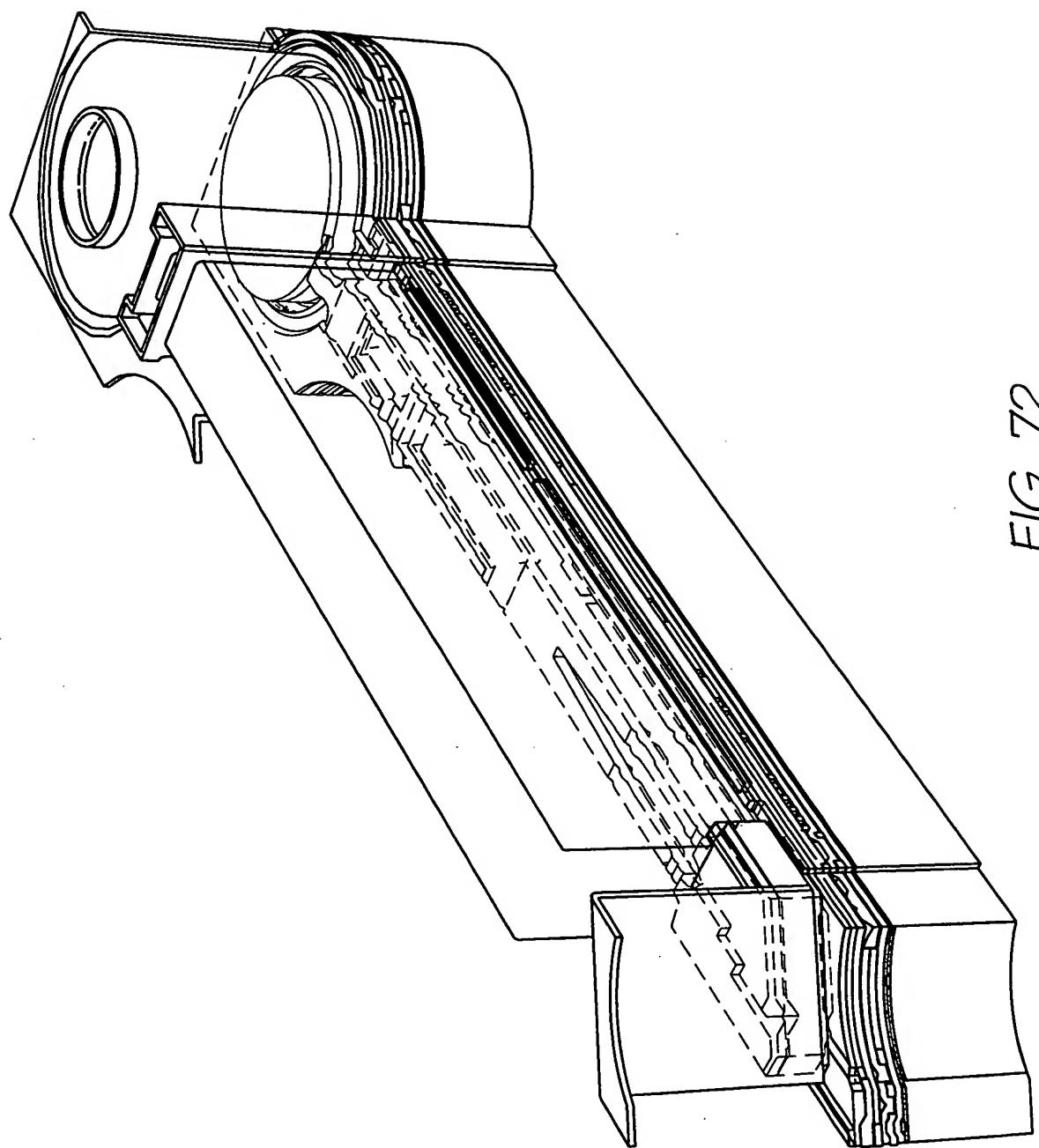


FIG. 72

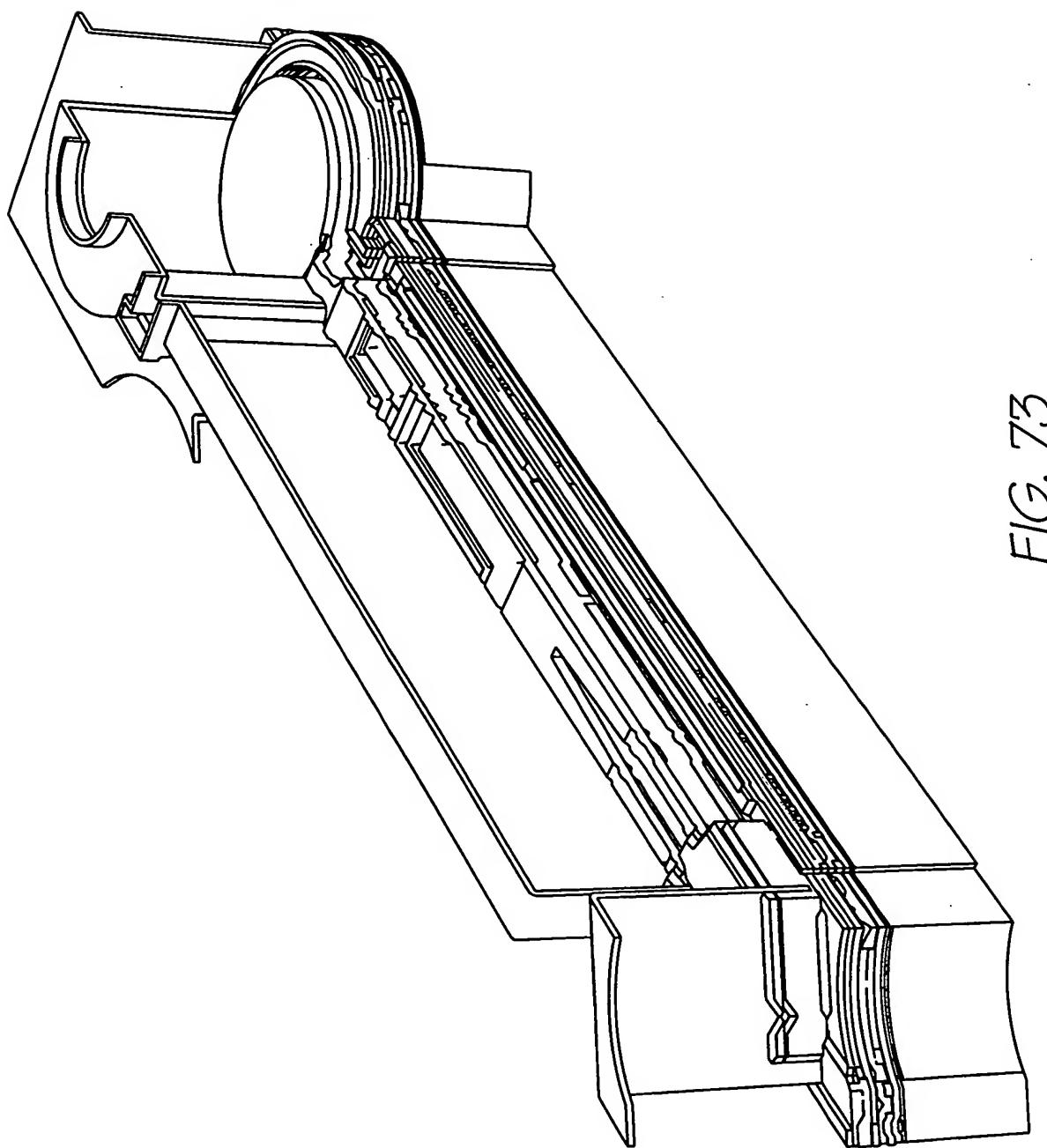
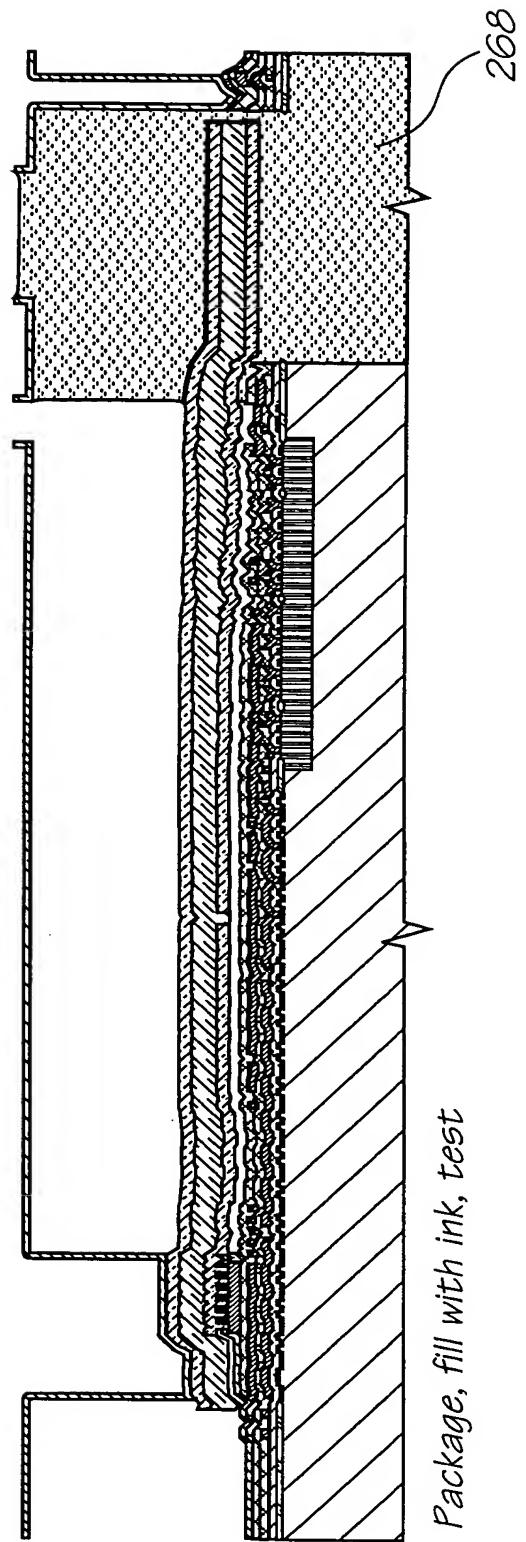


FIG. 73



Package, fill with ink, test

FIG. 74

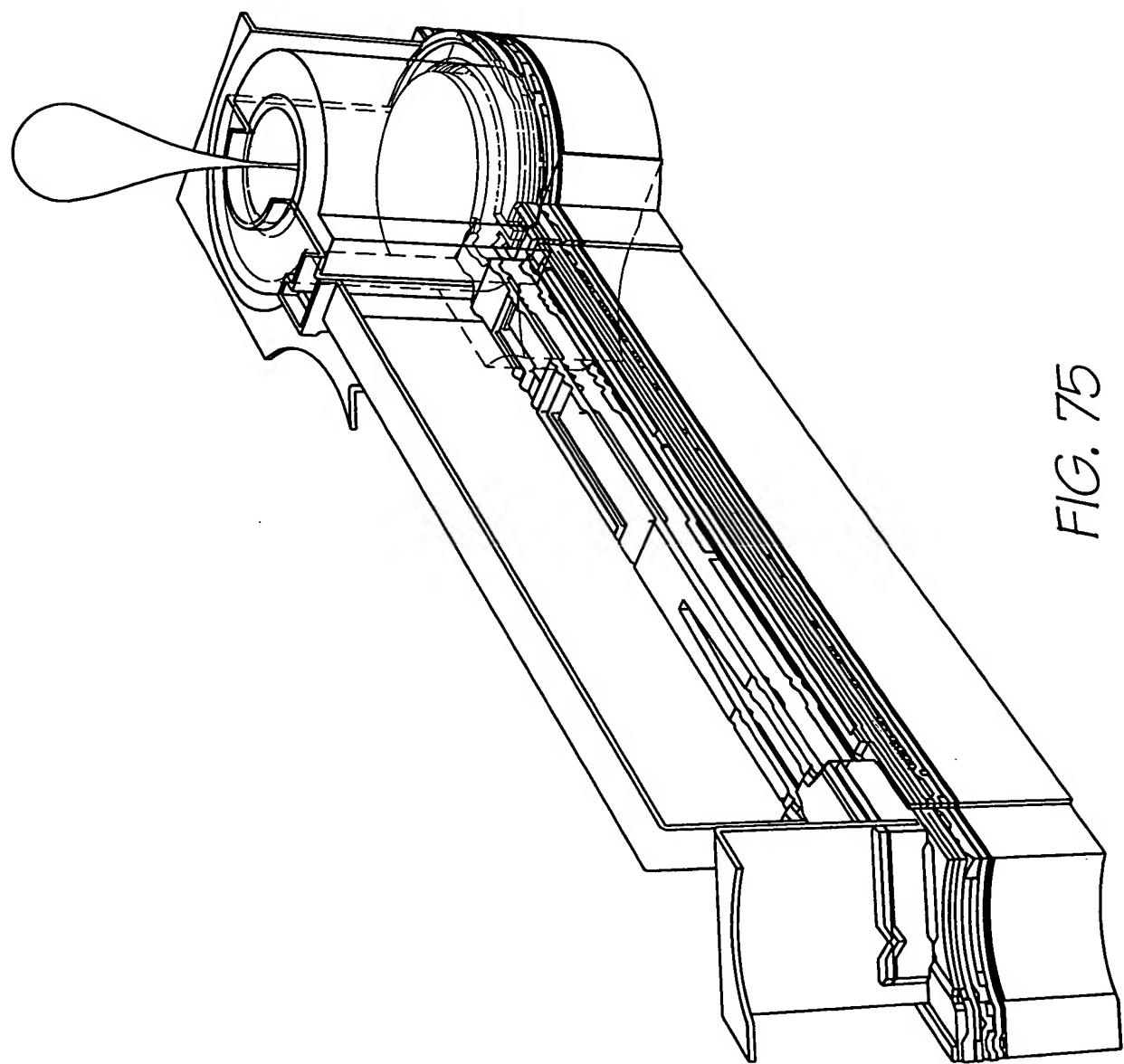


FIG. 75

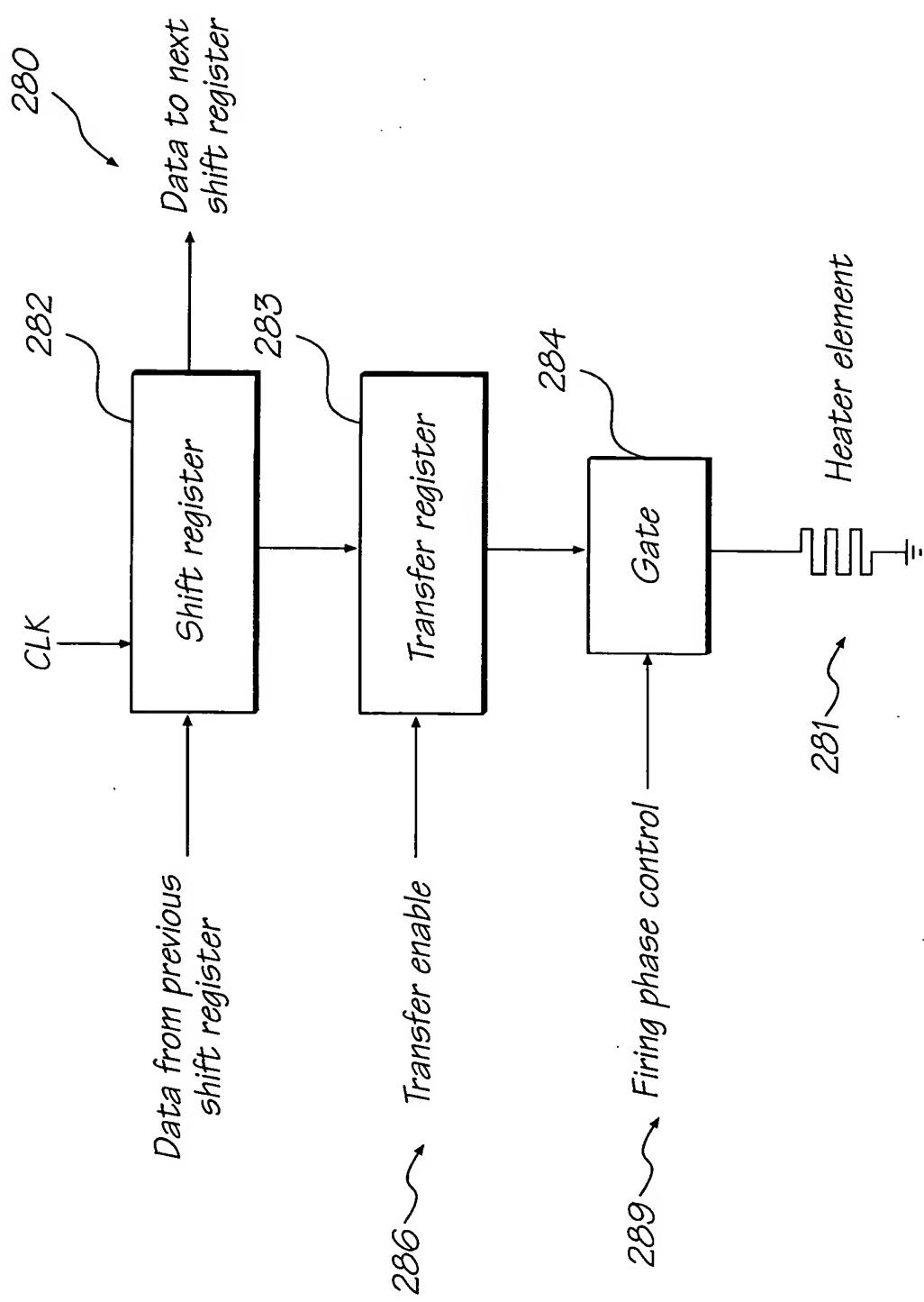


FIG. 76

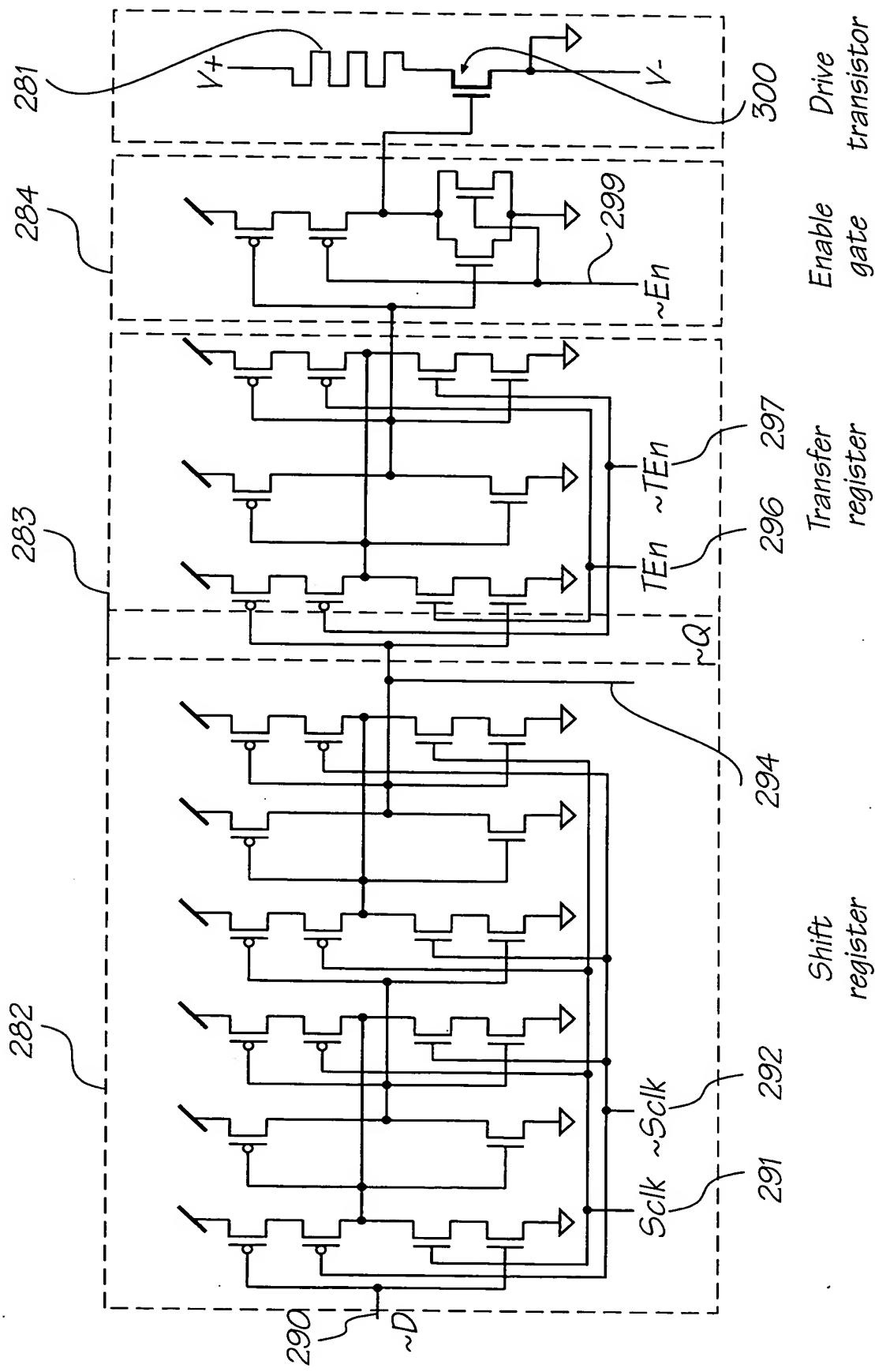


FIG. 77

## Key

	Silicon		Poly		Via 2		Actuator TiN		Cyan Ink
	Contacts		Metal 3		Actuator Glass		Magenta Ink		Yellow Ink
	Active		Metal 1		Via 3		Compensator TiN		Rim
	p+		Via 1		Sacrificial		Floor		Root
	n+		Metal 2		Sacrificial-nozzle		Wall		Shroud

FIG. 78

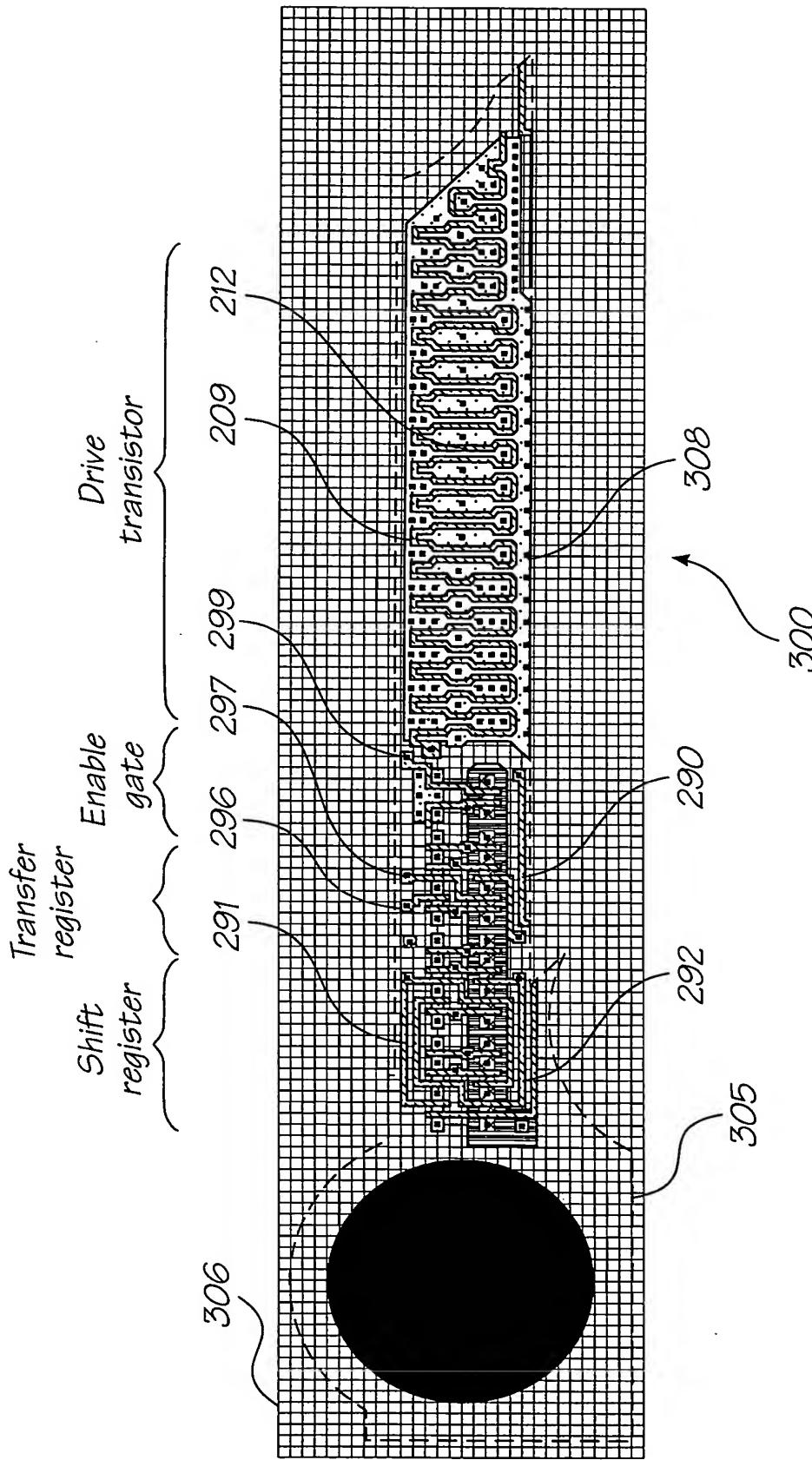


FIG. 79

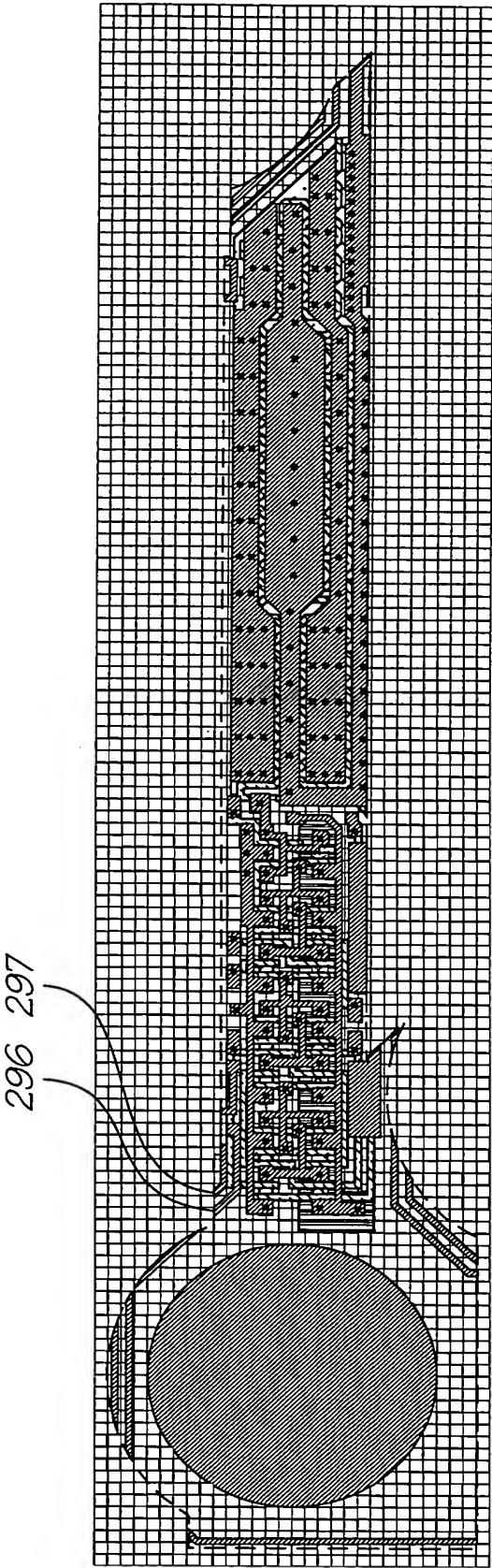


FIG. 80

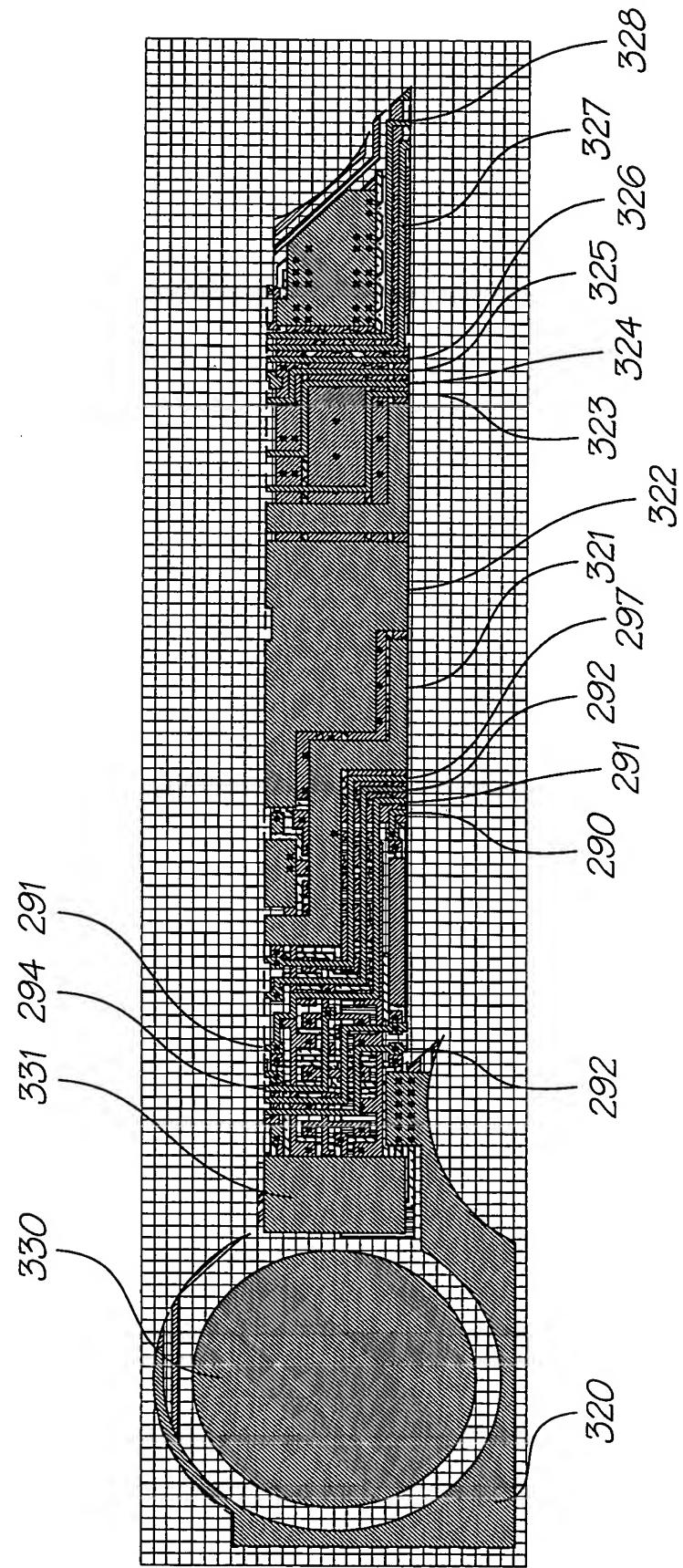


FIG. 81

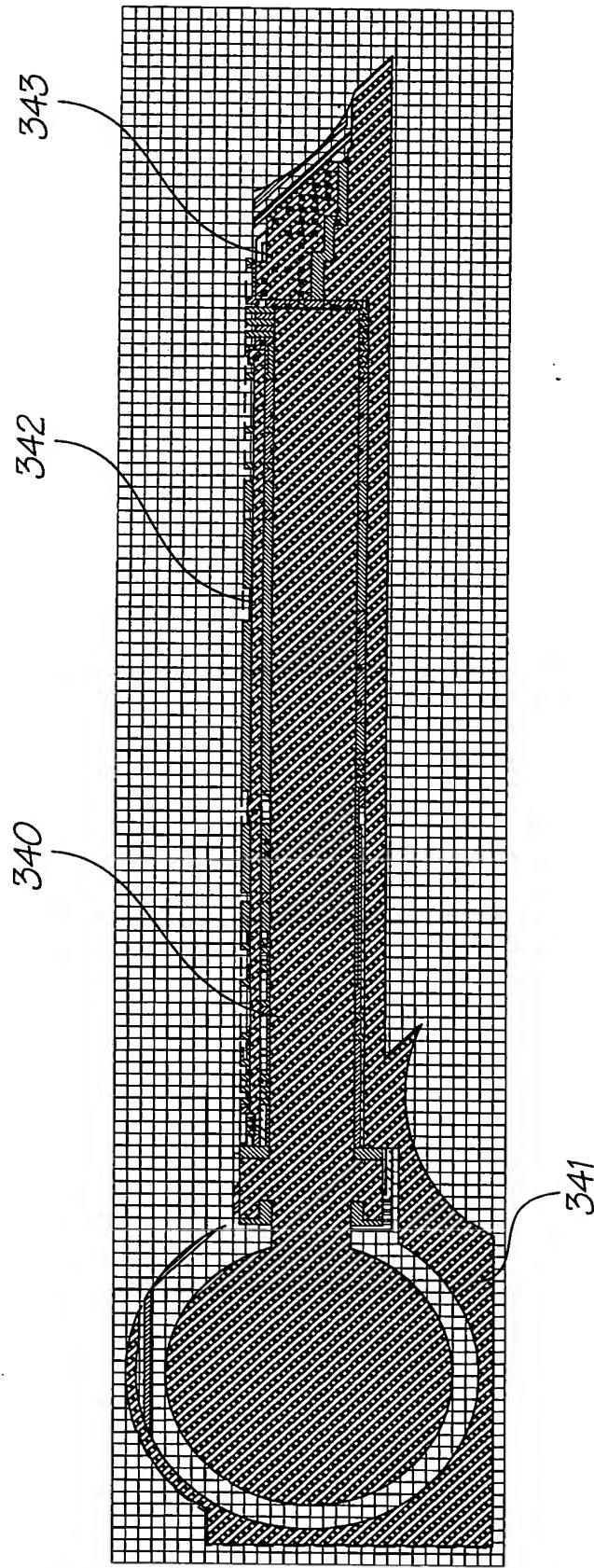


FIG. 82

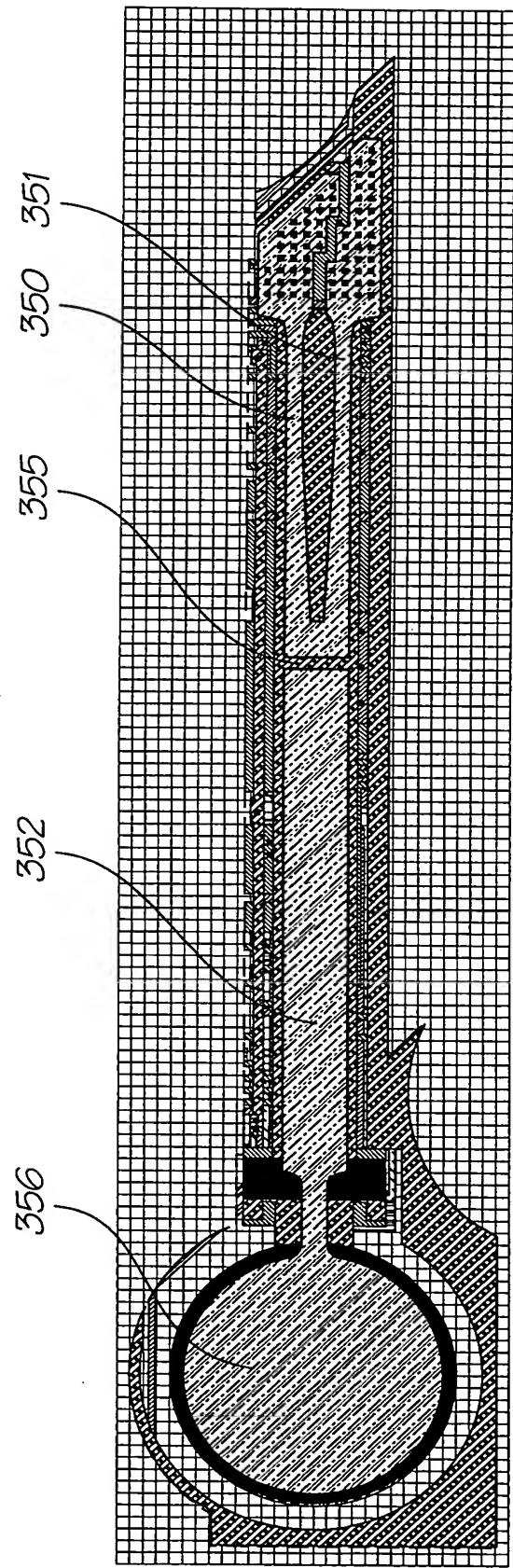


FIG. 83

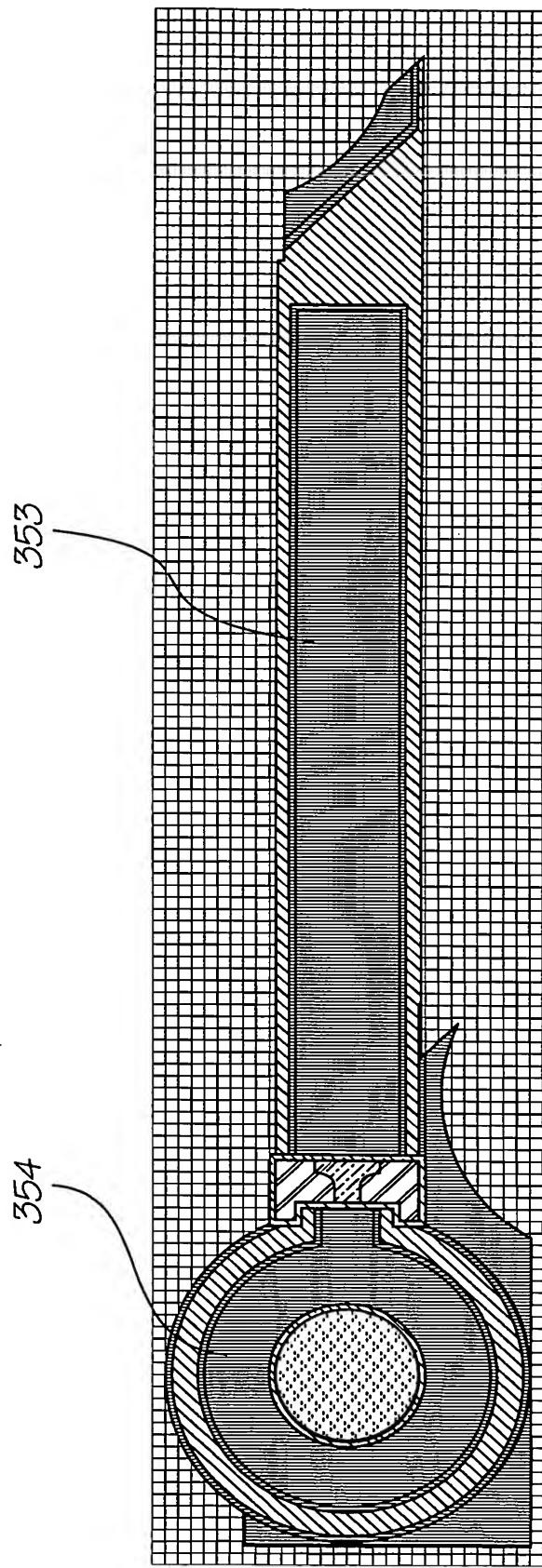


FIG. 84

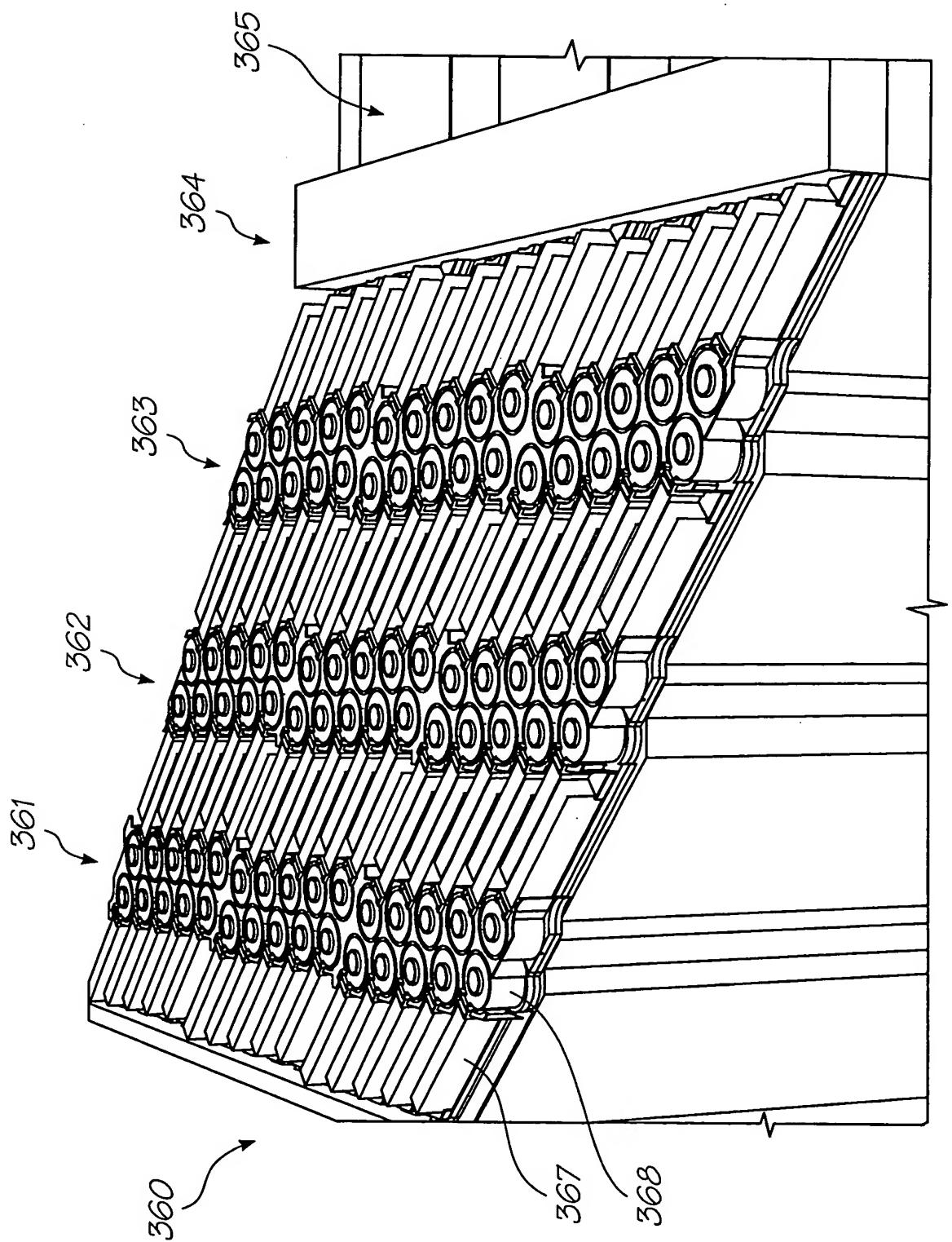


FIG. 85

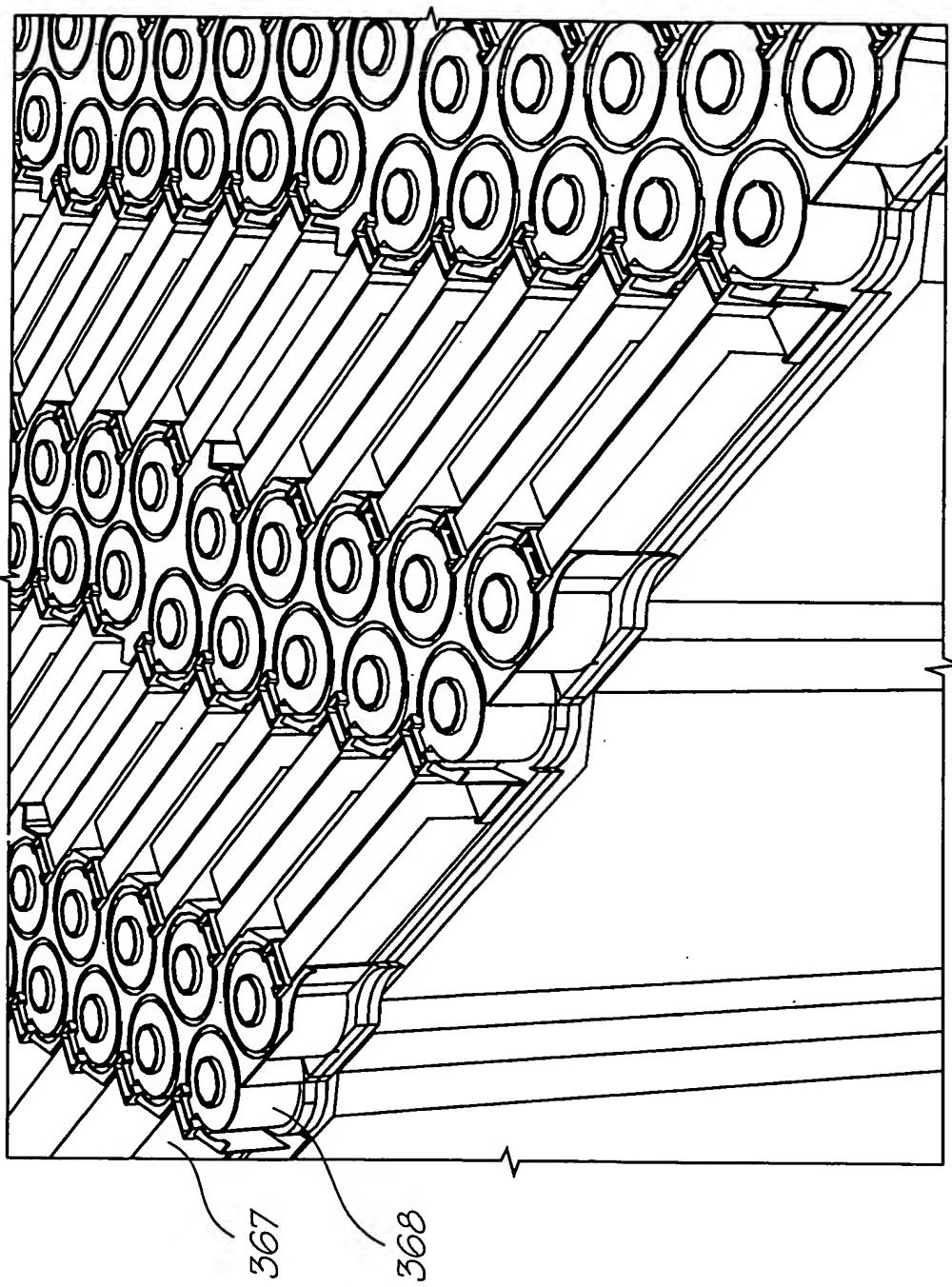


FIG. 86

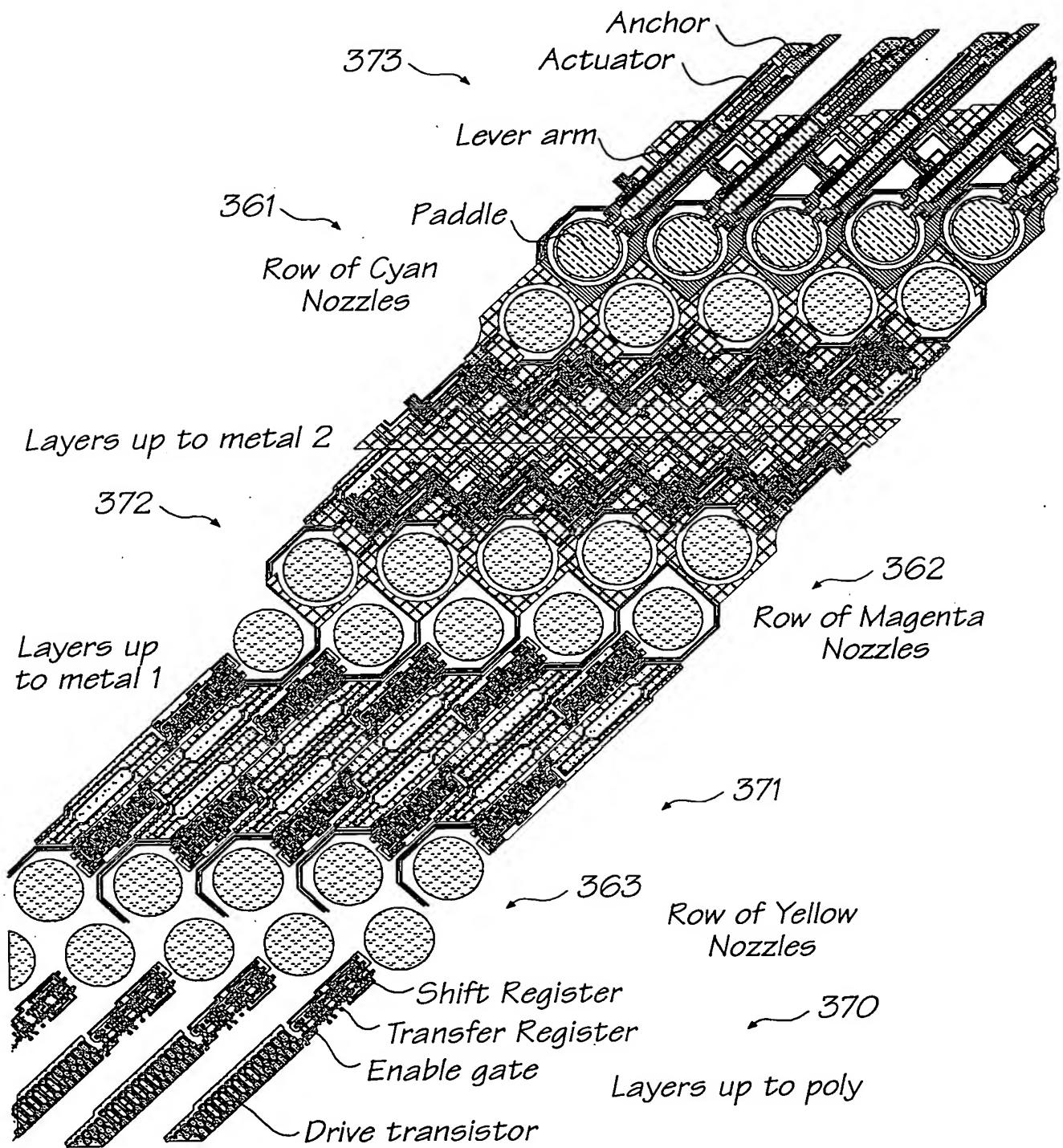
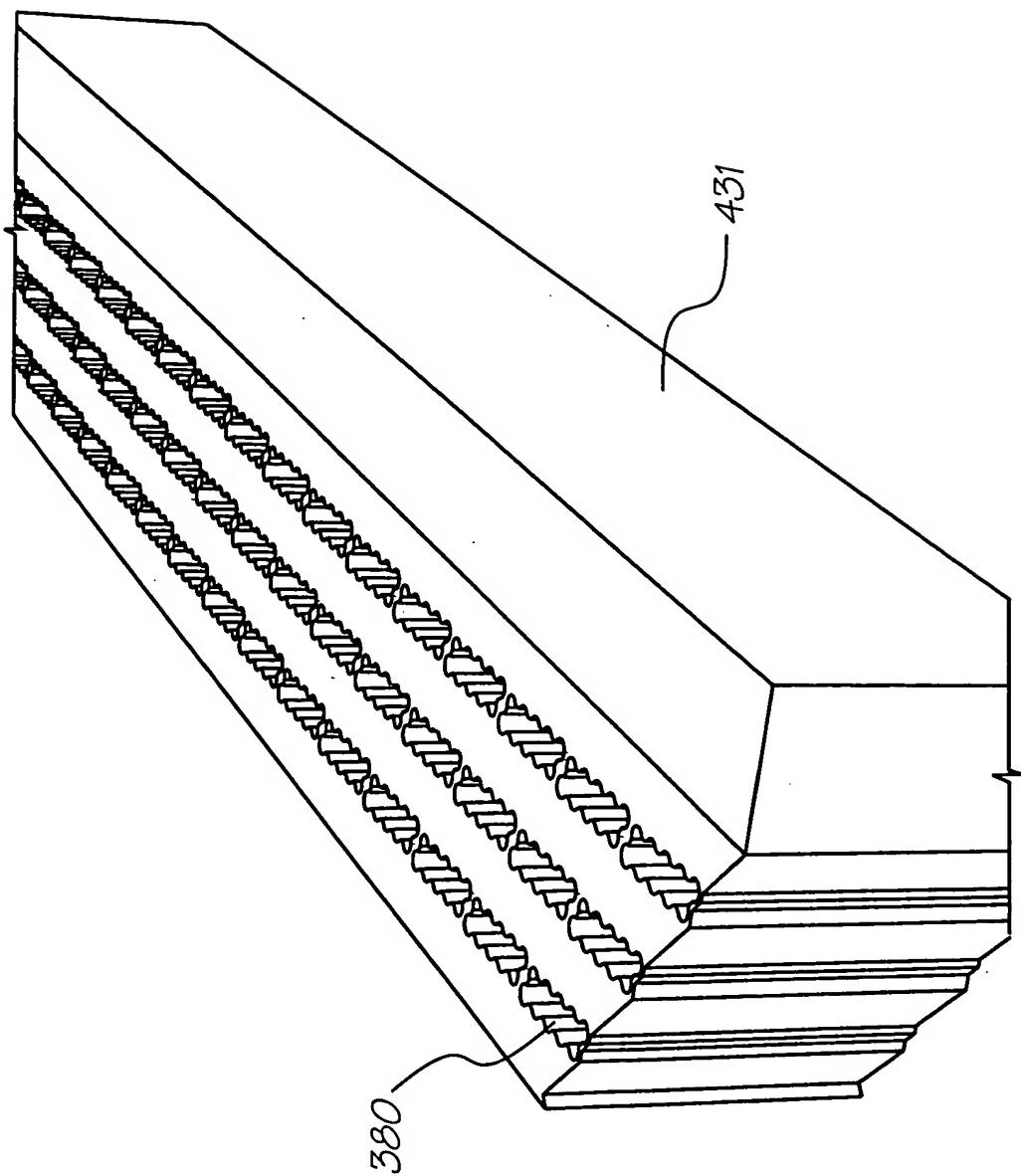


FIG. 87

FIG. 88



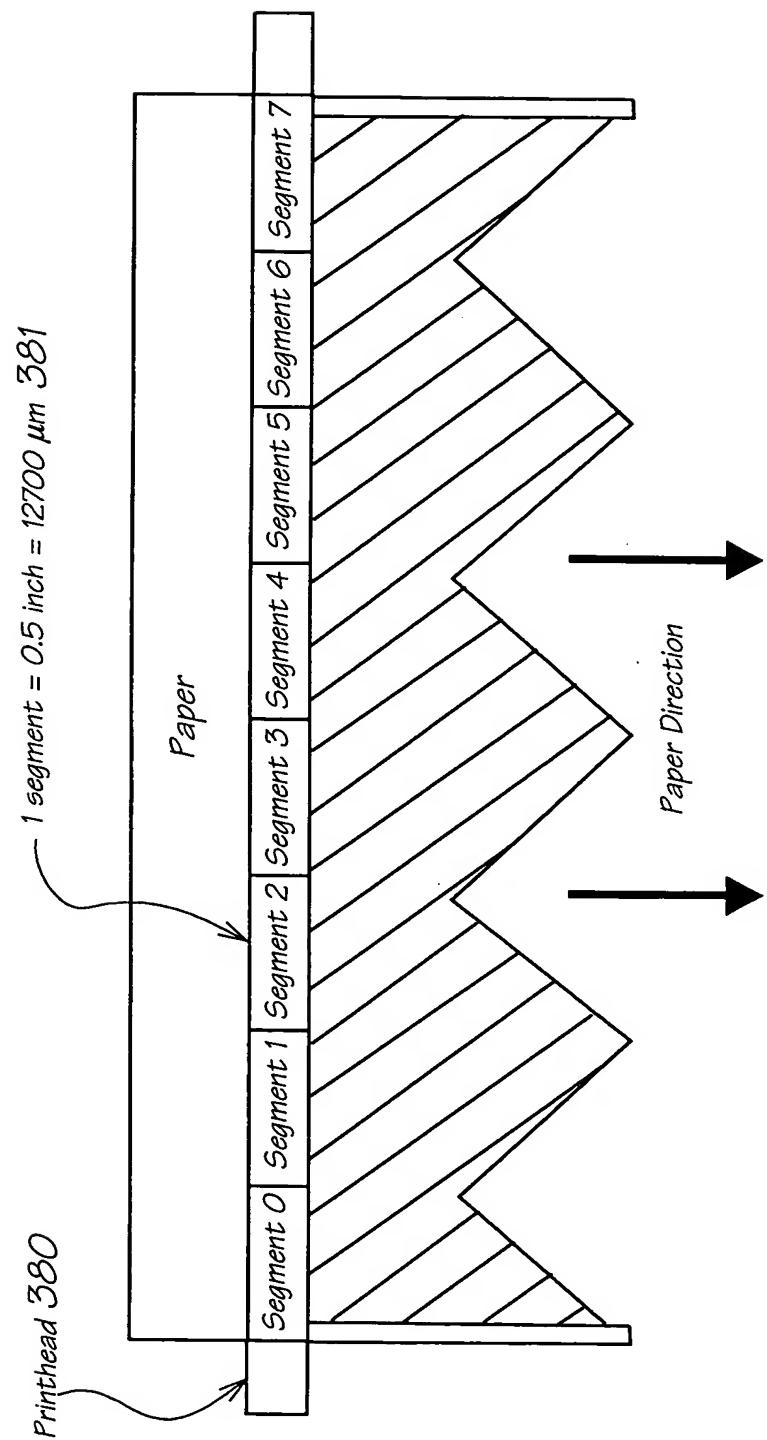
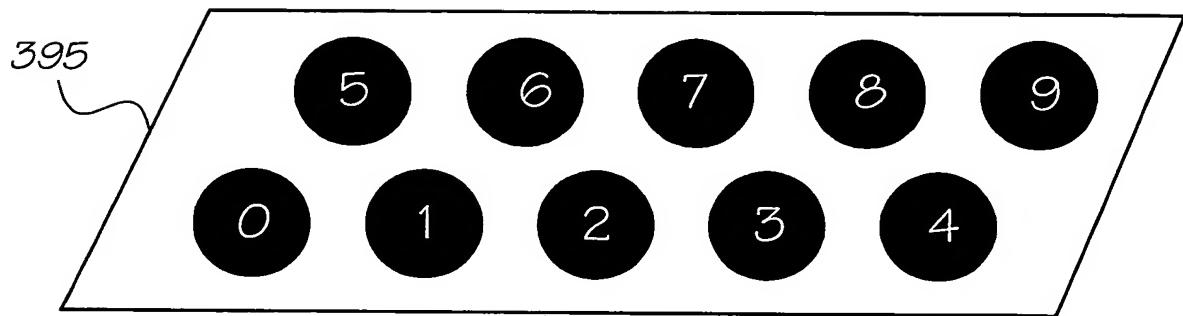


FIG. 8.9

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*A single pod, numbered by firing order*

FIG. 90

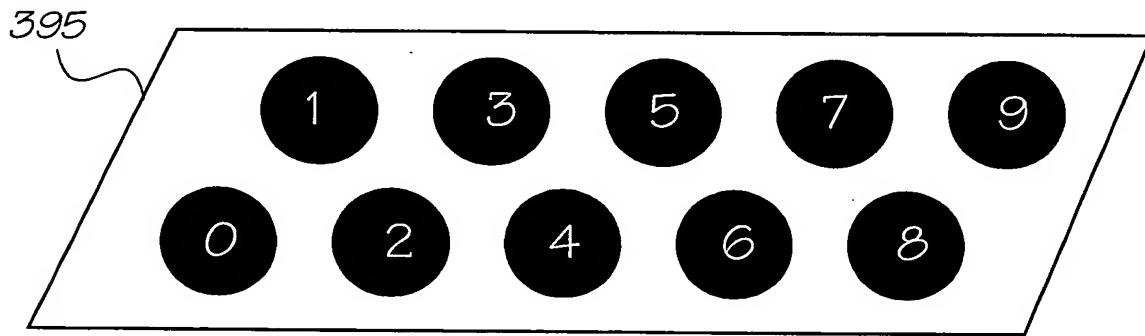


FIG. 91

*10 tripods*

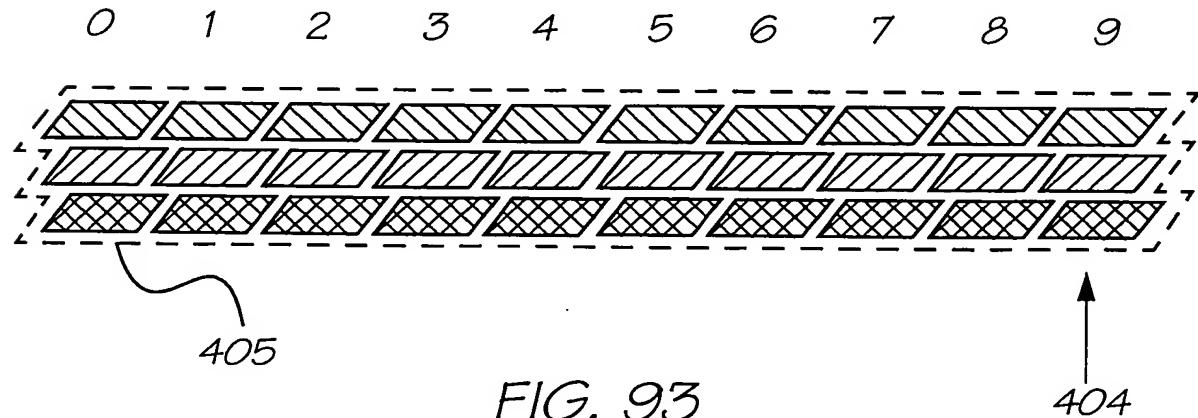


FIG. 93

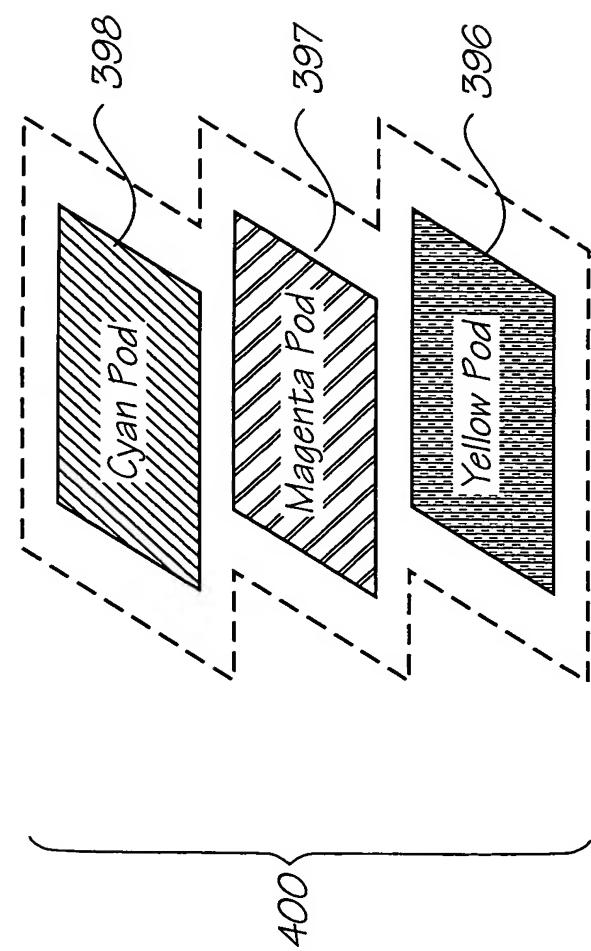


FIG. 92

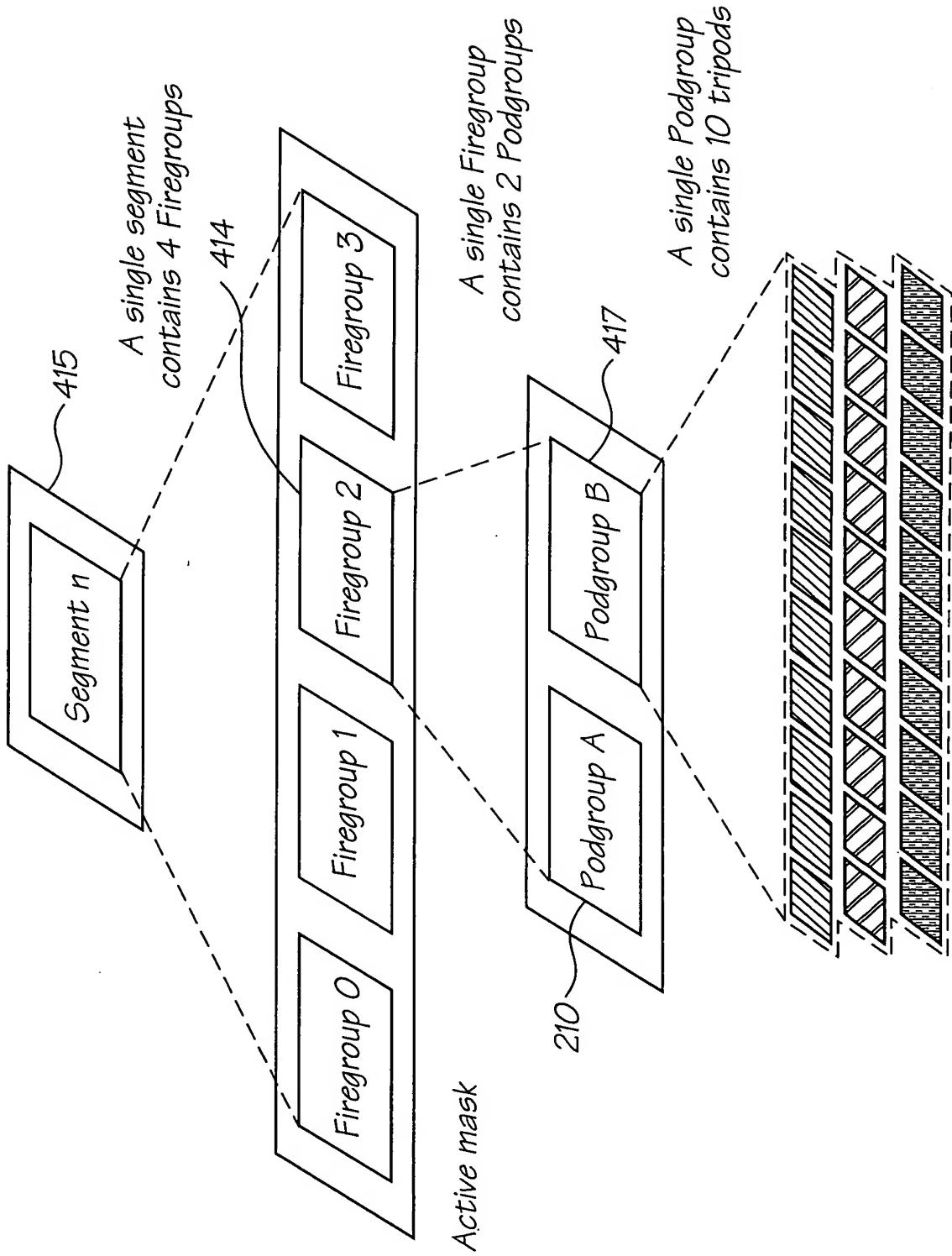
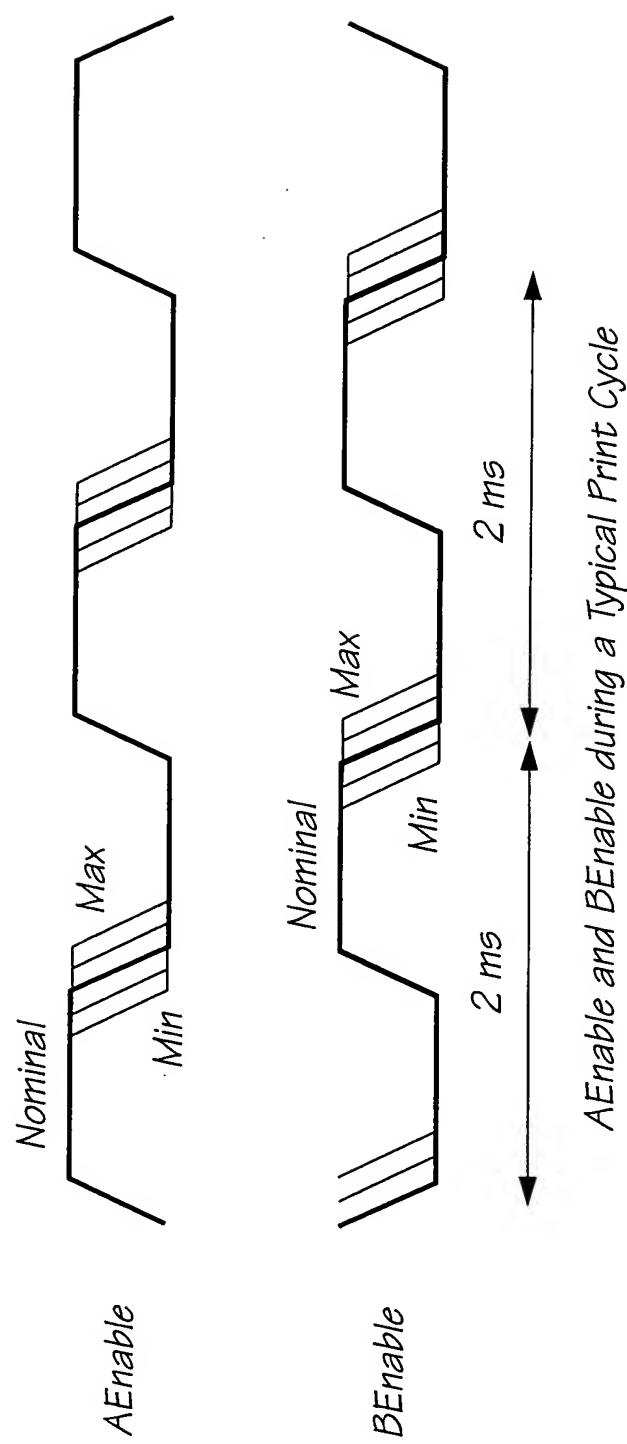


FIG. 94



AEnable and BEnable during a Typical Print Cycle

FIG. 95

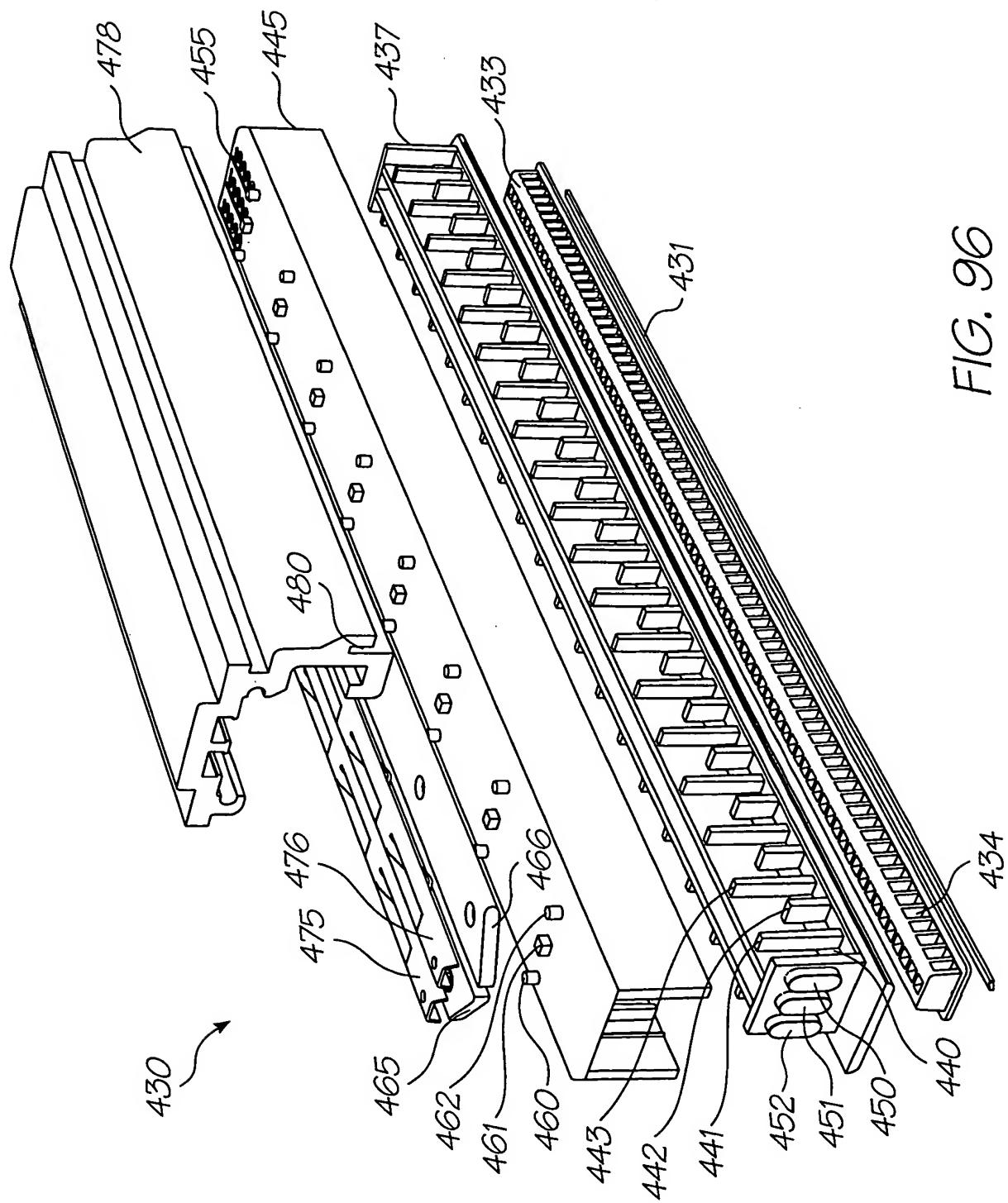


FIG. 96

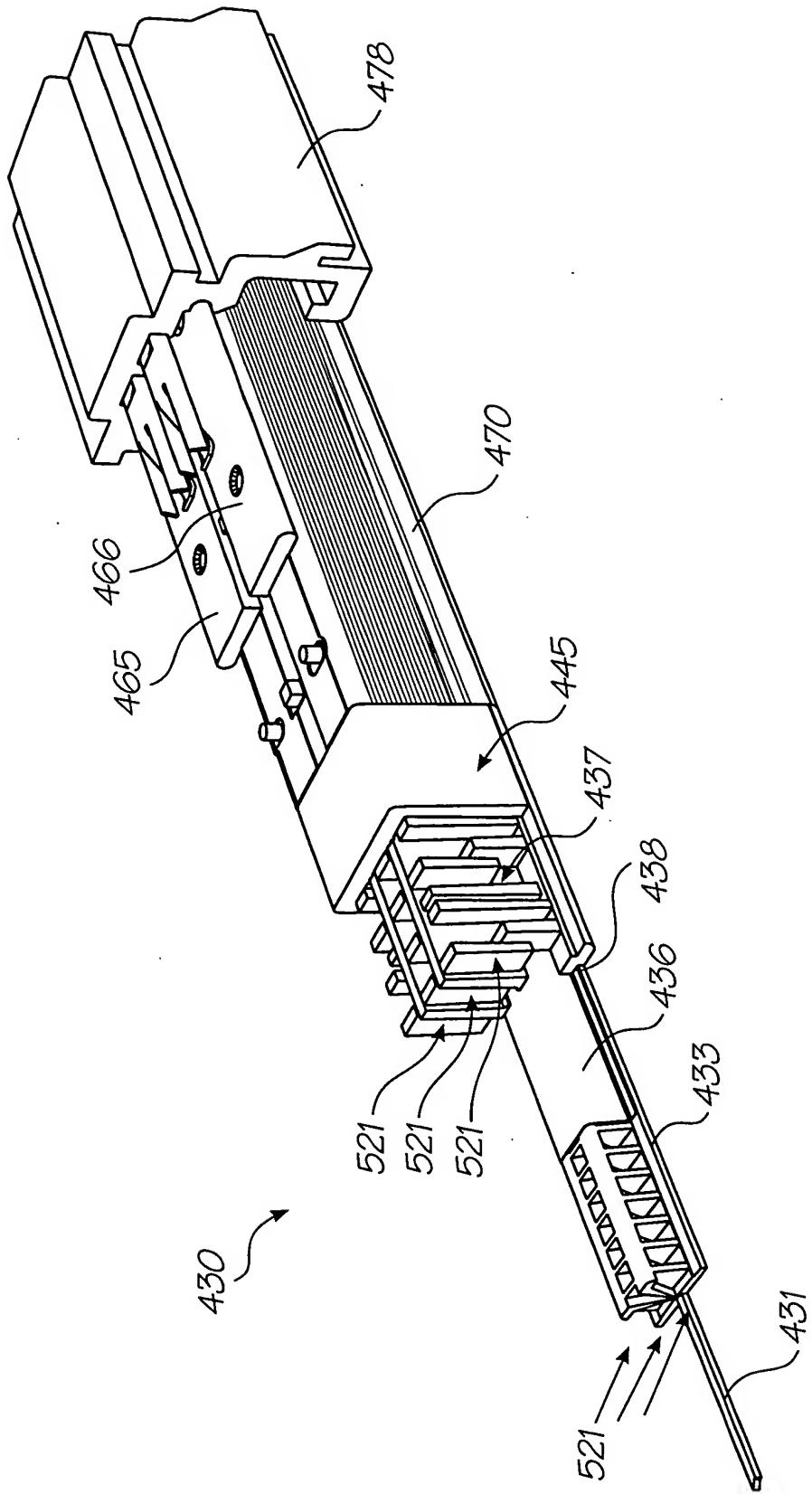
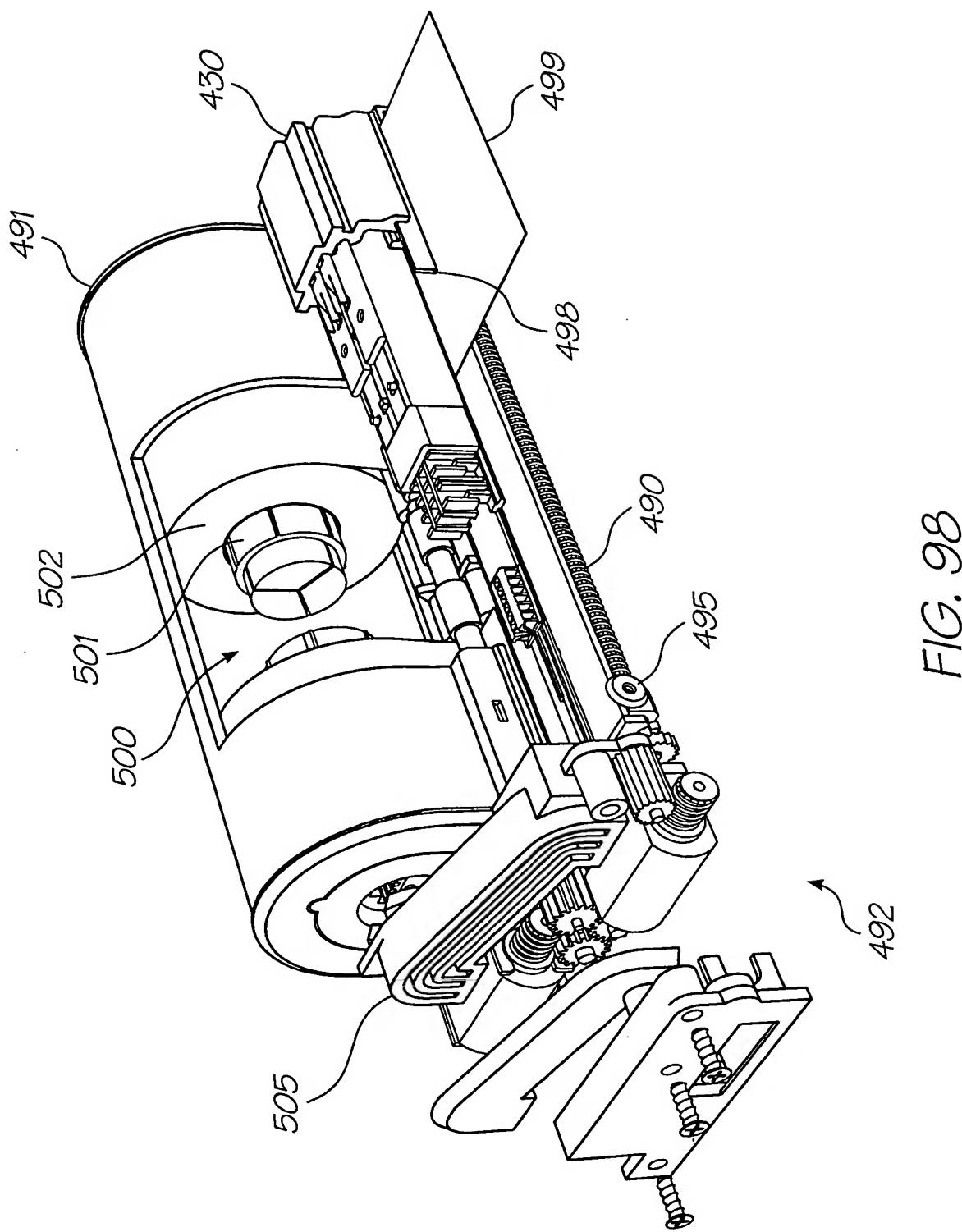


FIG. 97



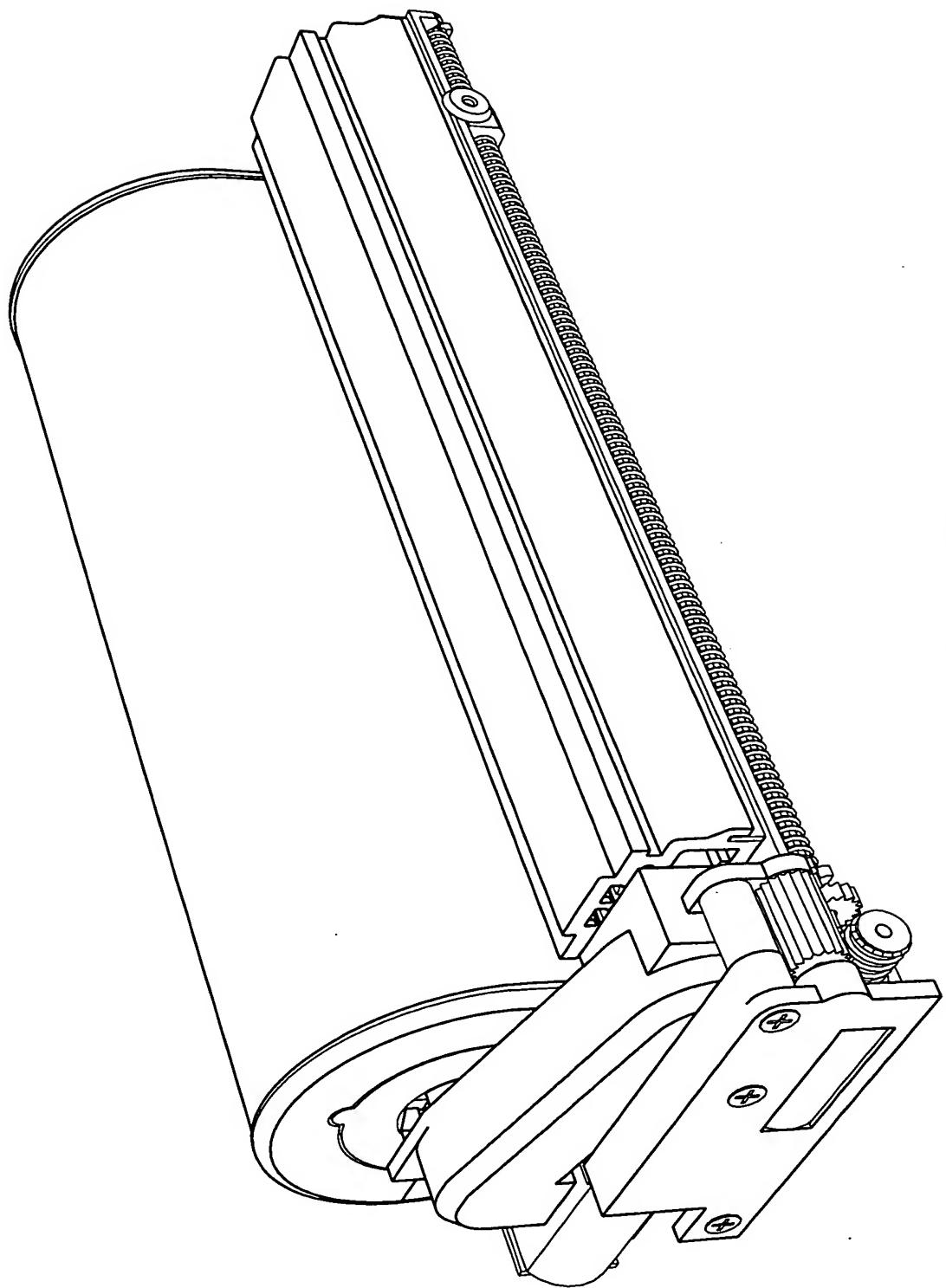


FIG. 99

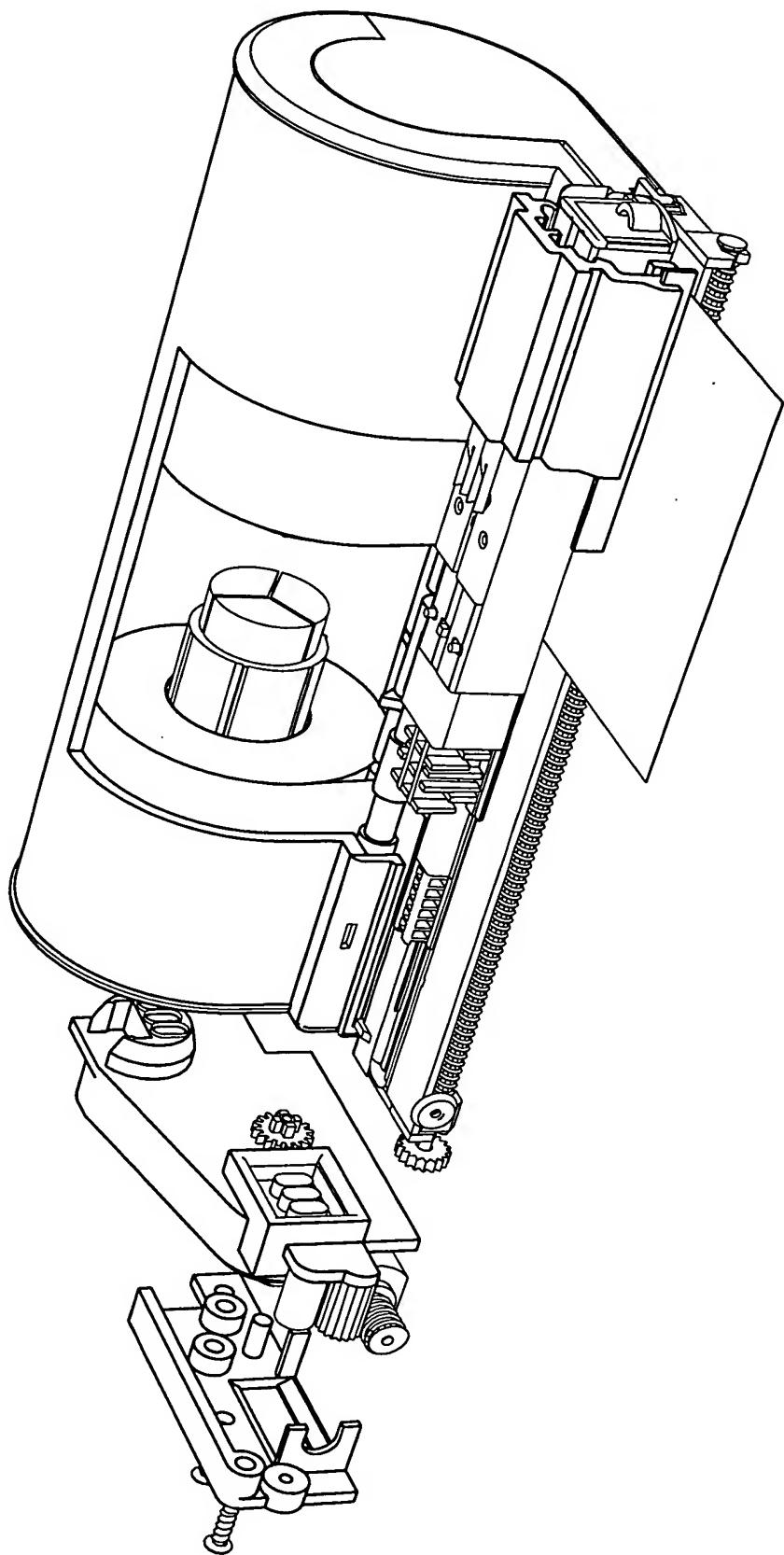


FIG. 100

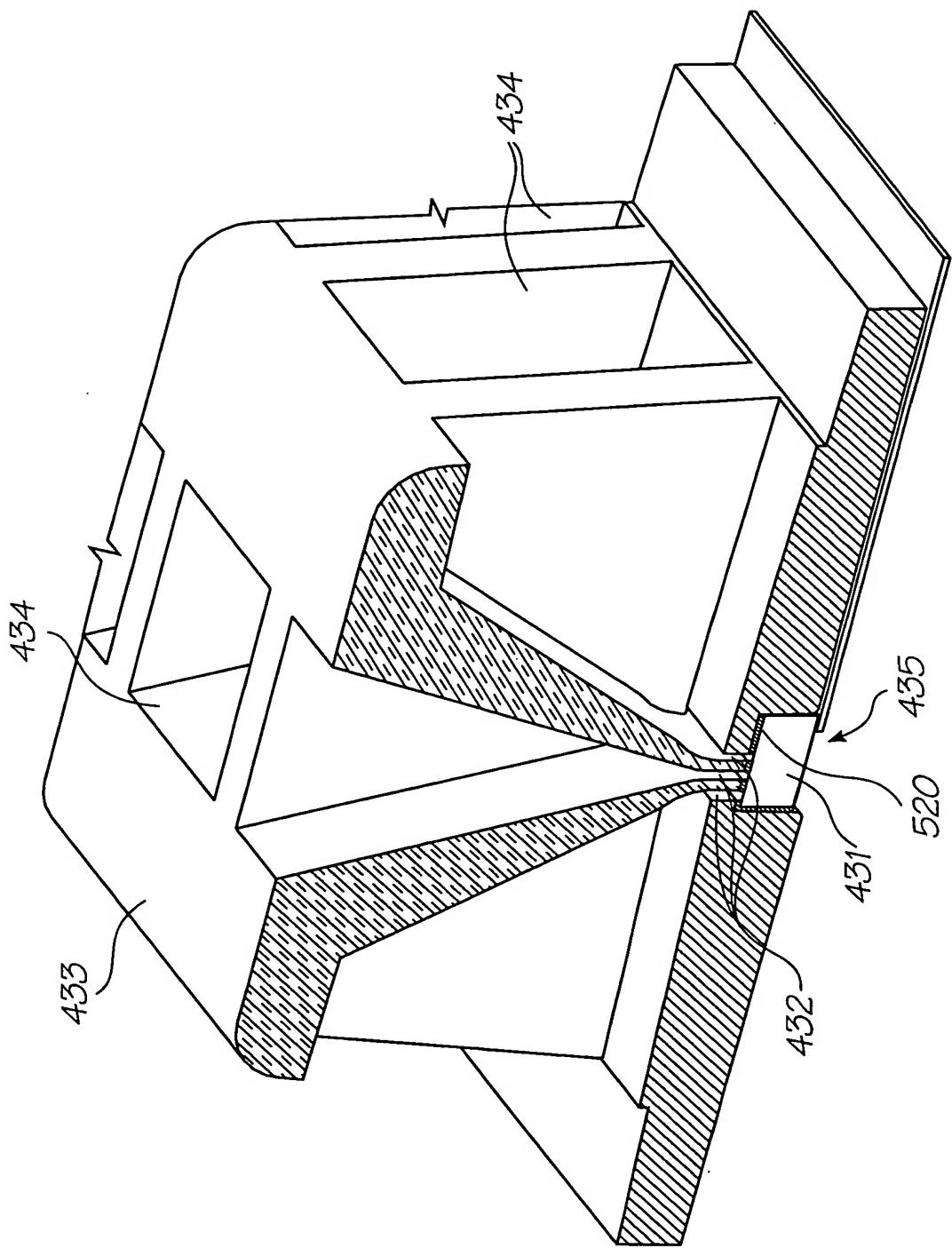


FIG. 101

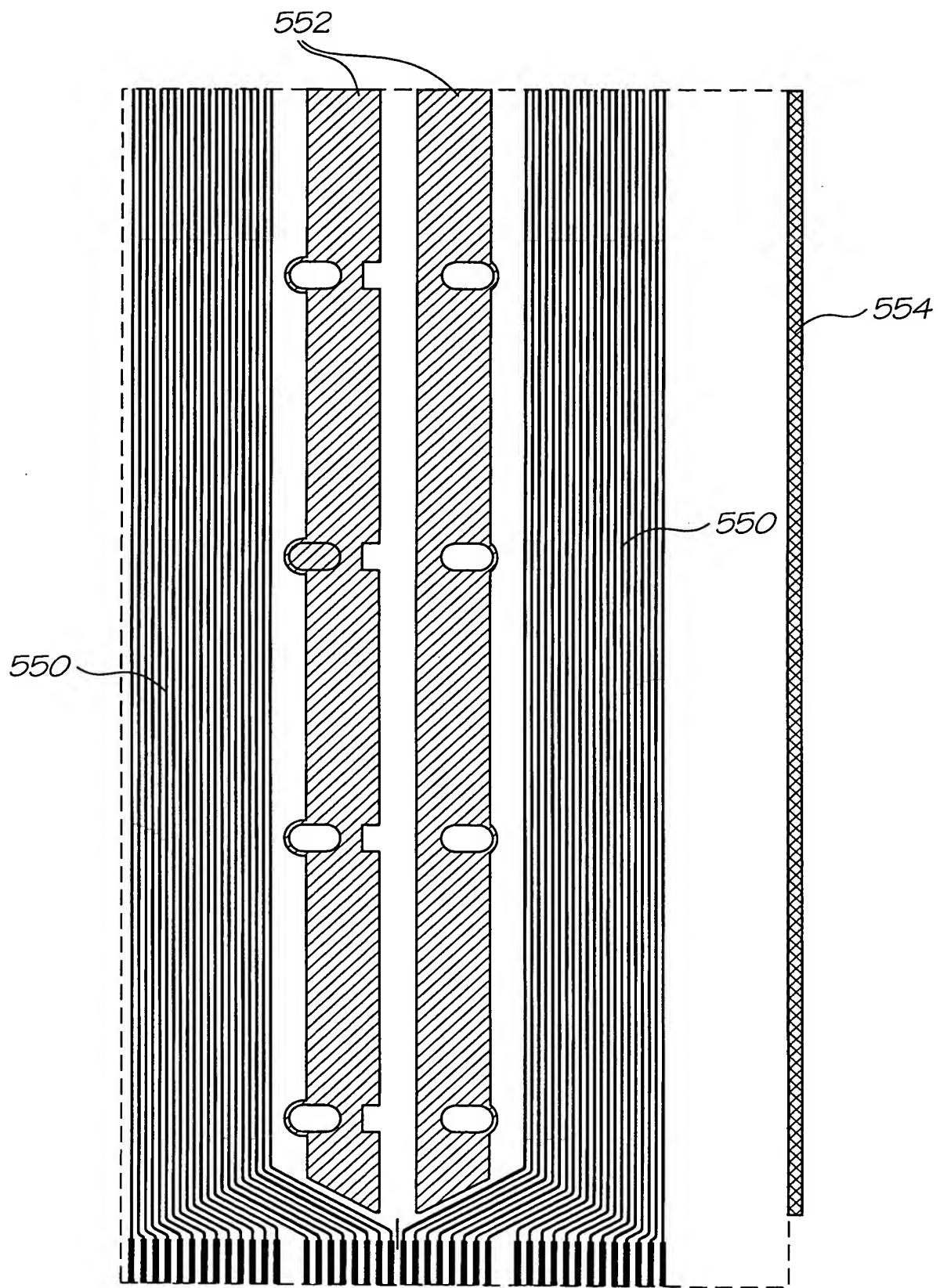


FIG. 102

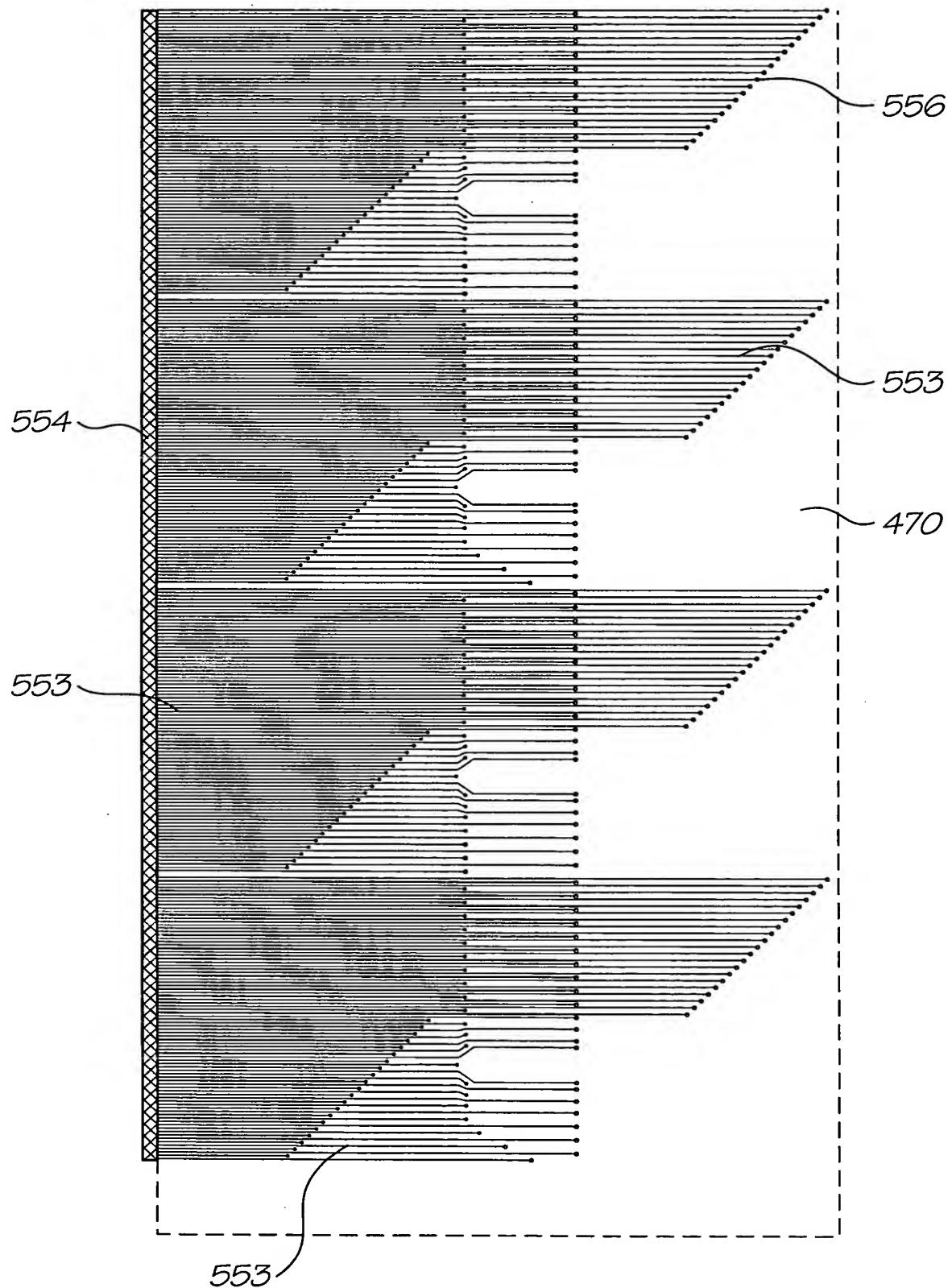


FIG. 103

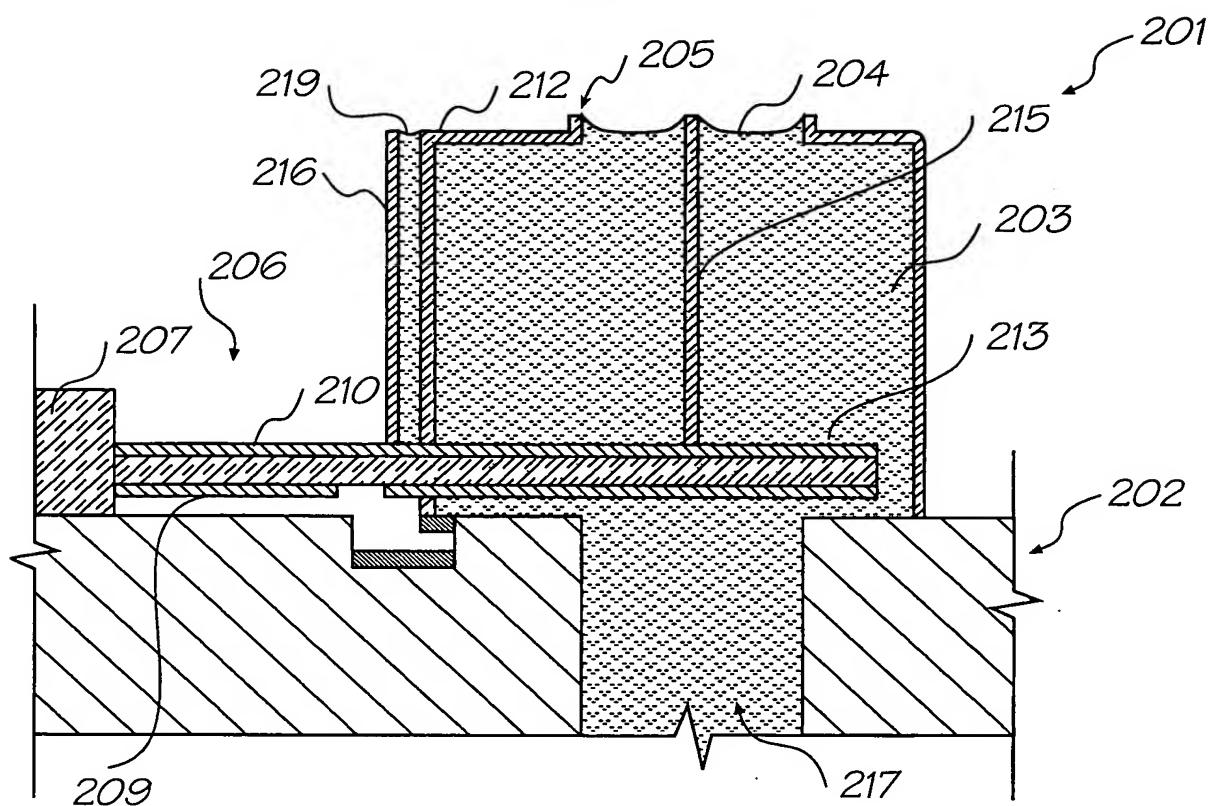


FIG. 104

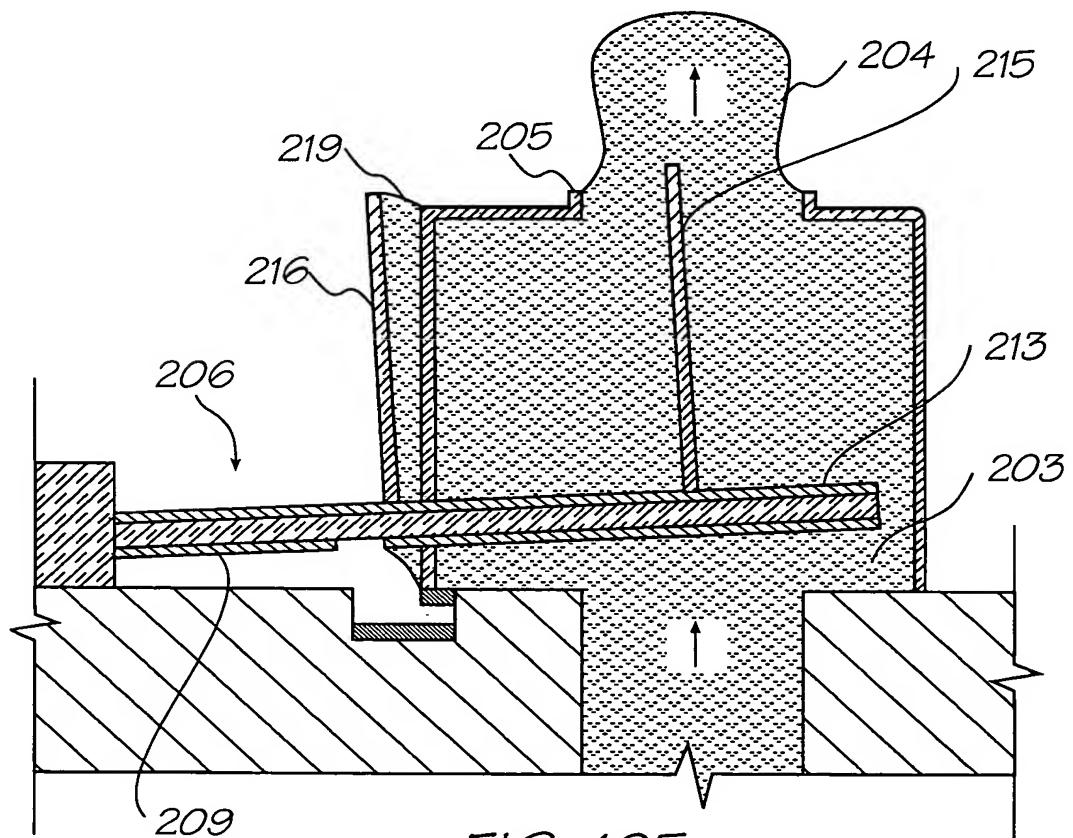


FIG. 105

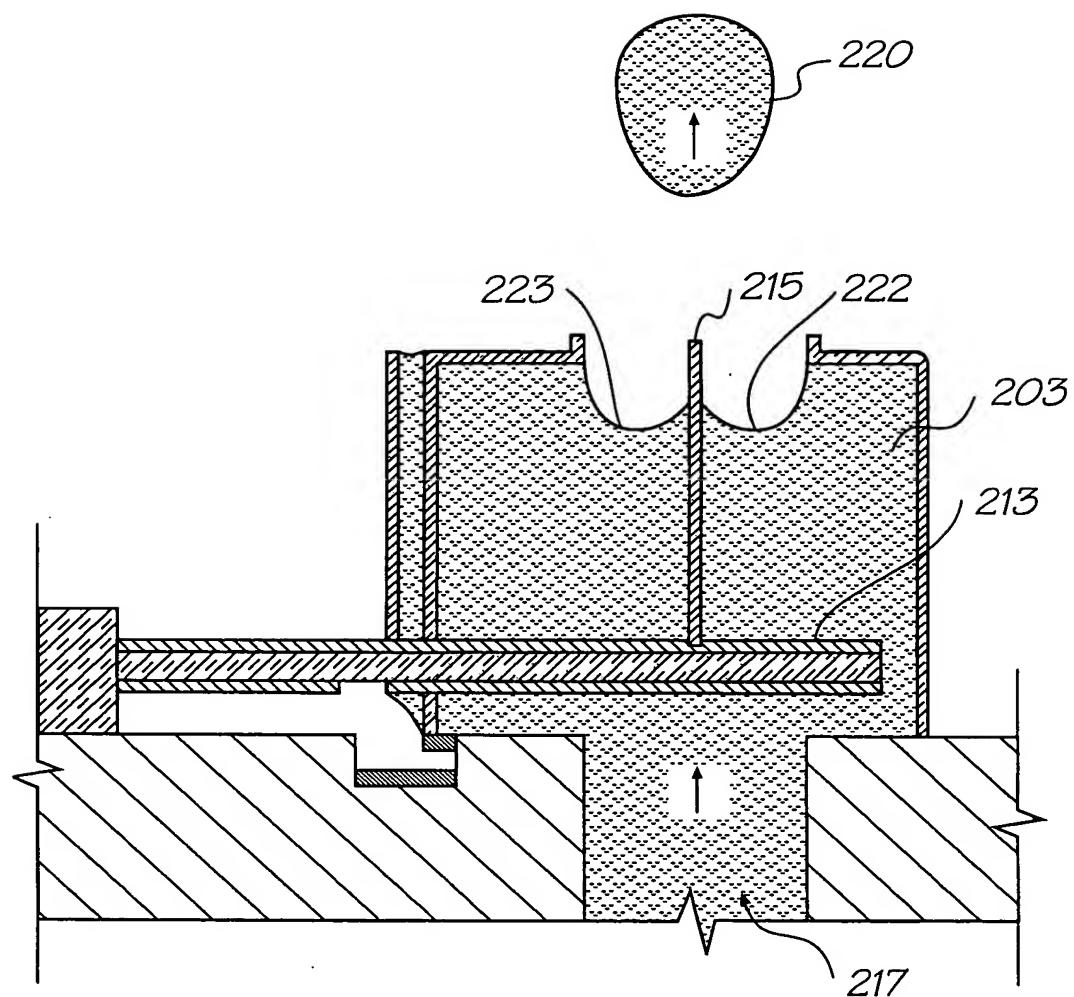
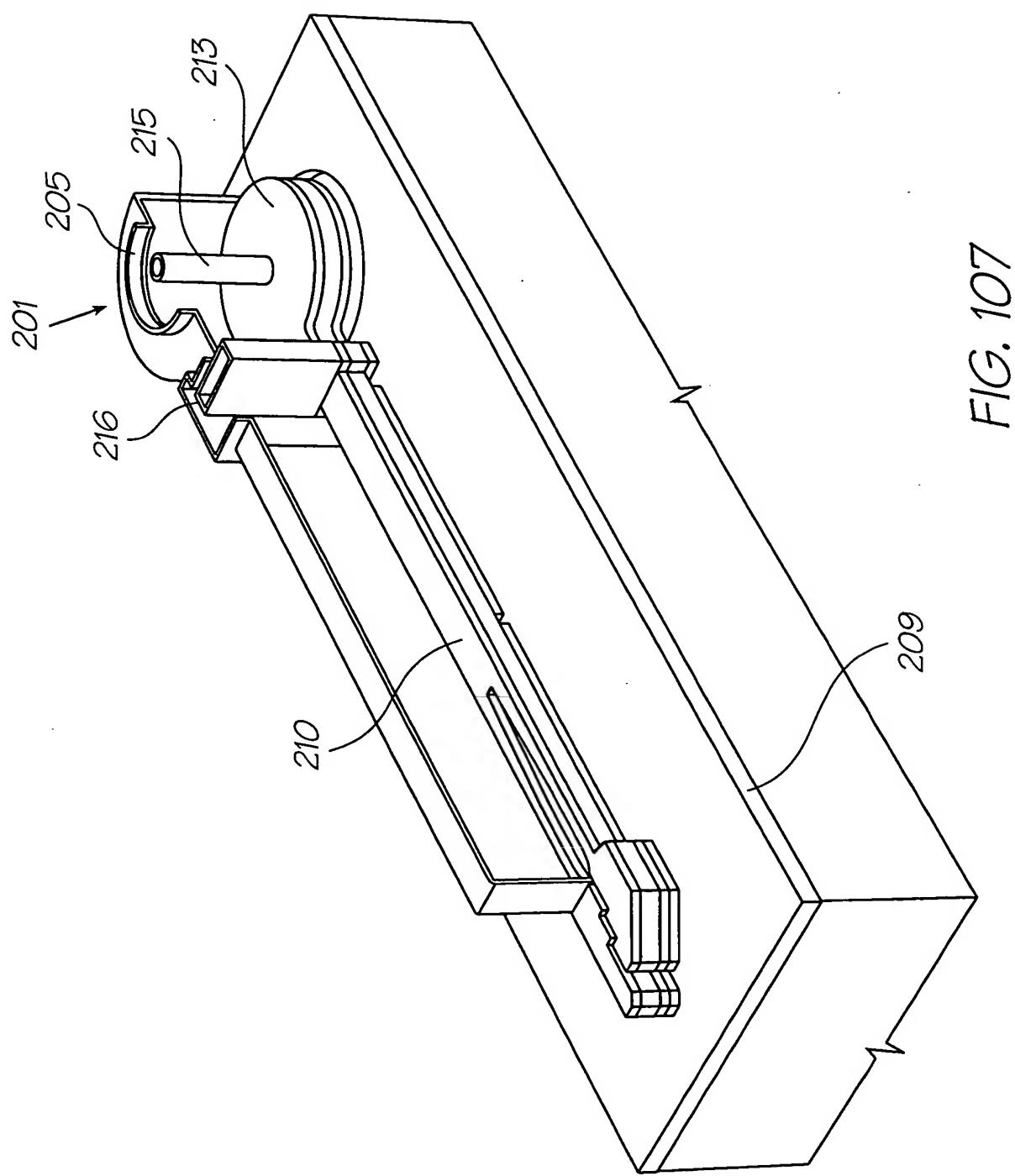
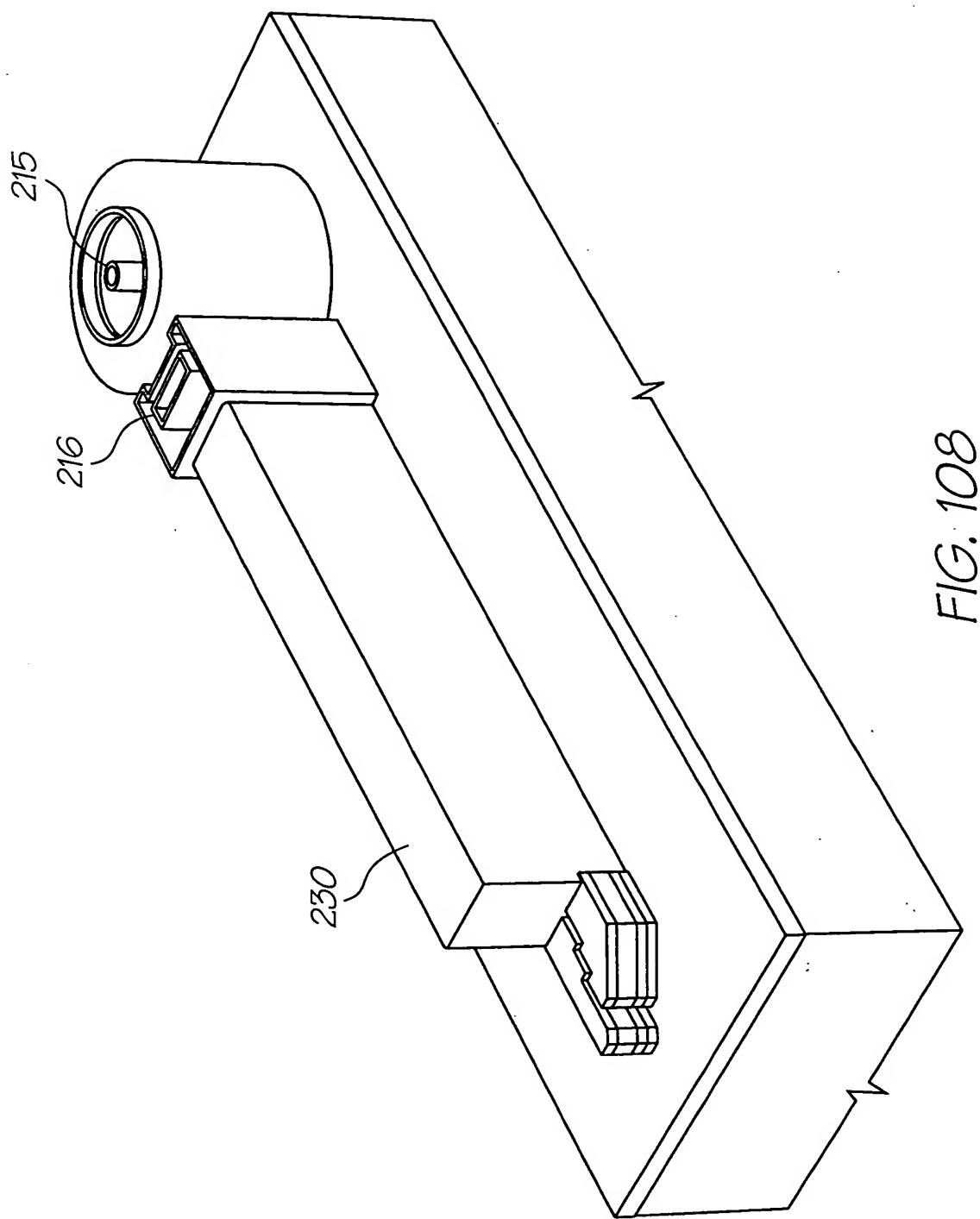


FIG. 106





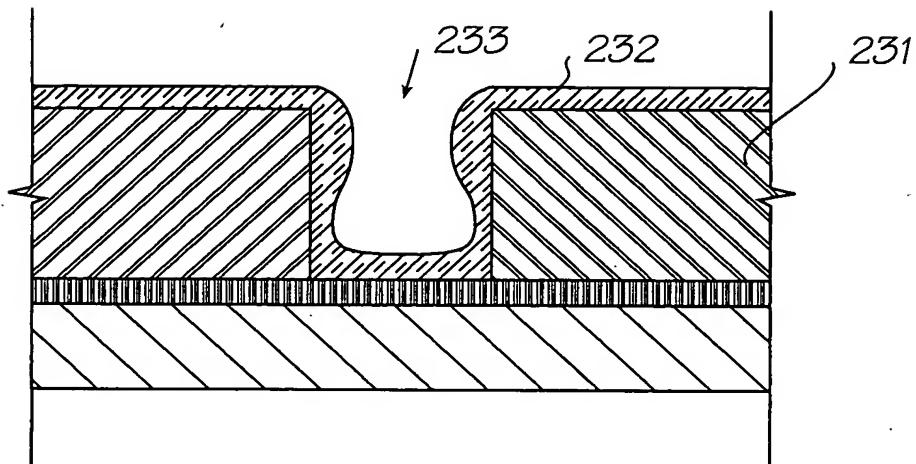


FIG. 109

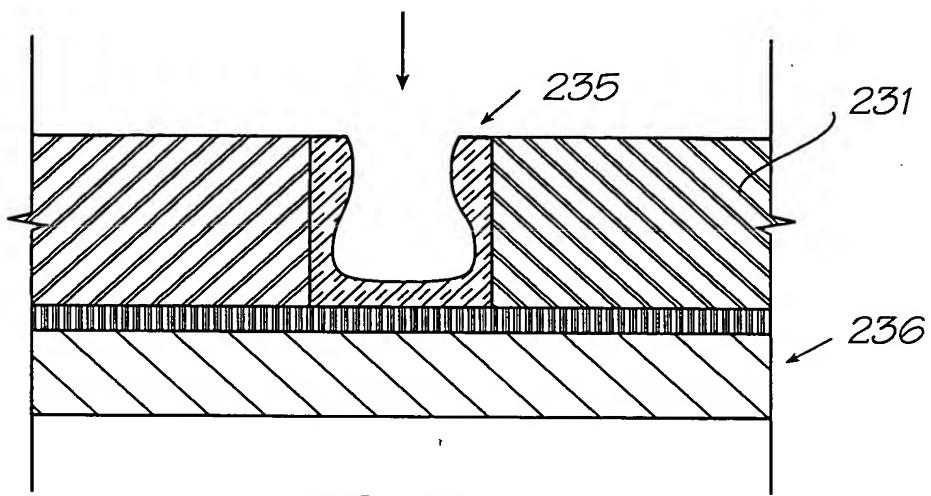


FIG. 110

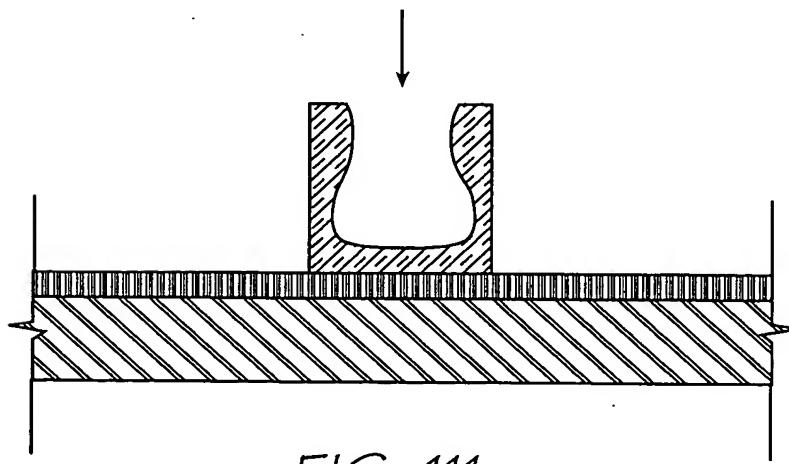


FIG. 111